Gas Journal

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Editorial Notes

Needed Rating Reform

With the heavy rearmament programme upon which the nation, however unwillingly, has been compelled by circumstances to embark, taxpayers cannot hope for any abatement of the heavy load of taxation to which they have become familiar. The odds are even in favour of an increase in taxation, and if this is found to be essential it cannot be doubted that our people will once again rise to the occasion. On all sides the blessings which accrue from living in a peaceful country, democratically governed, are increasingly appreciated, and we cannot doubt that the preservation of our national heritage and the peace of the Country, if not of the World, outweighs the strain which the heavy incidence of taxation must involve.

The tried wisdom of the Chancellor of the Exchequer is sufficient guarantee that if there must be an increase in taxation it will not be such as to stifle industry, for it is only a fool who would slay the goose that lays the golden egg. The heavy demands of the national exchequer are regarded as inevitable or necessary by the vast majority of the nation, but in order to meet them a zealous scrutiny of all other items of expenditure will become essential. Of these items, none is more onerous than the burden of local rates, and, although it may not be wholly justified, a feeling does exist in many quarters that some check should be placed upon the spending capacity of local authorities if the demands of the Inland Revenue are to be met.

Not only are the assessments of gas undertakings extremely—and in many cases unfairly—high, but the whole procedure relating to rating assessments is as cumbersome and expensive as any Gilbertian hero could devise. The mere fact that some of the larger gas undertakings have to deal with three score or more of Rating Authorities, and that any alteration of apportionment in one area might involve a variation of all the other apportionments, is a sufficient indication of the extent of the inconvenience and annoyance caused. Further, the Rating Authority may be one and the same with the electricity undertaking, and there would be nothing to prevent the personnel of the rating assessment committee from resembling strangely the personnel of the electricity committee. Is such a tribunal, however well meaning, calculated to inspire confidence in a gas company? It is true that an appeal lies to Quarter Sessions, but one might well ask how it happens that, if Quarter Sessions are not thought to be appropriate tribunals for income-tax appeals, they are entrusted with the more complicated duty of hearing rating appeals.

Most serious of all is the continual worrying of public utilities by certain Rating Authorities. The basis of the Rating and Valuation Act, 1925, was that there should be quinquennial valuations, and indeed the Central Valuation Committee has issued recommendations that normally the assessment, once fixed, should be maintained for the quinquennial period. It cannot be denied that cases may arise in which some adjustment during the quinquennial is necessary and reasonable. These cases are, however, the exceptions to the rule that undertakers should not be continually badgered and nagged during the currency of the quinquennial valuation list. "We do not want a revaluation," says the crafty Authority; "we just want a review to see that everything is going along normally." That "review" entails as much work as a re-assessment, and is in many cases desired solely to see if some small point cannot be discovered upon which to peg a claim for a few more pounds on the assessment. It is the story of the child digging up the bulbs to see how they are growing. In some cases the mere opening of a road for main laying is regarded as an opportunity to extract a bit more for the rates. And what can a gas company do but pay rather than face a losing battle fettered by hopelessly unsuitable procedure?

Surely the public utilities which have faced so bravely the depression and the increasing burden of income-tax deserve something of the Chancellor. It must never be forgotten that public utility undertakings were debarred from the derating benefits conferred on many of their competitors. The call therefore comes the more urgently that the Government should give facilities for legislation relating to the assessment of public utility undertakings for local rates. Such legislation was promised during the passage of the Rating and Valuation Act, 1925, through Parliament; surely the time is now ripe for its fulfilment.

Heating Trends

In the "JOURNAL" for Feb. 10 last we commented on the Paper which Dr. F. S. Sinnatt, Director of Fuel Research, contributed at a meeting of the Glasgow Section of the Society of Chemical Industry, in which he contended that our Industry does not appreciate as it should the fact that it is supplying the requirements of a fluid, ever-changing market, that it needs a great deal more quantitative information of what is taking place in the domestic heating field, a surer knowledge of how the changing habits of the people and the sway of public opinion will influence the future sales of gas and coke. At the same meeting Dr. E. W. Smith urged the setting-up of a "Bureau of Economics" within the Industry, to study every phase of the Industry from the economic point of view, the effect of changes in the tastes and habits of the consumer, and so on, and to collaborate with government departments in carrying-out surveys of domestic and industrial requirements for heat and light. Dr. Smith also pointed out that analysis of the national income shows that in 1934 over 85% of the population were dependent on incomes of £5 a week and less; and he quite rightly argued that no industry catering for a national service can progress unless its primary object is to cater for the masses, and that the Gas Industry to-day best caters for the masses by producing coke as well as gas.

In view of the foregoing it is interesting to turn to the February issue of the Journal of the National Smoke Abatement Society, in which is published a report on a questionnaire sent to housing authorities on smokeless equipment in housing schemes. This questionnaire was sent by the Society in April, 1936, to all the larger local authorities asking what their practice was as regards the heating and cooking appliances fixed in their new houses; and copies of the questionnaire were also sent to the voluntary housing societies. The number of replies received was 131 from local authorities and 46 from housing societies, and the report states that sufficient information was received to show what is the general practice of local authorities and housing societies. The inquiry was confined to working-class houses, and the replies have much significance for our Industry. Proportionately to the total number of replies received the housing societies make more use of gas for heating bedrooms than do local authorities; a great many of the latter, however, fix gas points in a varying number of rooms, making it possible for the tenant to equip himself with smokeless heating for bedrooms without much expense. As for wash boilers, gas is the fuel most commonly used, but, states the report, "it is a little surprising to find that the London County Council has supplied coal-fired coppers in the majority of the houses built by them. While the report gives the Gas Industry a pat on the back for the early introduction of the prepayment meter, which has played such an important part in popularizing gas, it remarks that the electricity industry is far ahead with the two-part tariff, and "even the poorer tenants in re-housing schemes are finding it possible to use electricity for heating and cooking on this system. . . . Much more recently a two-part tariff for gas has been introduced by a few of the gas undertakings, and this should increase greatly the use of gas for water heating and room heating." The report brings out the immense popularity of gas for cooking, and it is recorded that in some mining districts gas cookers are fixed in spite of the fact that miners get free coal allowances.

The Open Fire

We now come to what we regard as the crux of the situation: "Though one may assume that great and increasing use is being made of gas and electricity in new houses, and that all or nearly all of these are provided with the essentials for using one or both when present or future tenants so desire—or local prices make it possible—there yet remains the fact that all houses have one open fire which is in use for the greater part of the year, in some districts all the year." The most interesting replies to the questionnaire in this respect are those that record experiments with coke-burning grates. Among the replies is that from Leeds, which has passed the "experimental" stage, and where from 1935 onwards the proviso has been made that all ranges installed in Corporation houses must be suitable for coal or coke. The Housing Director stated in his reply that although the organization for the delivery of coke was not yet complete a considerable number of tenants were availing themselves of its use, and "they did not experience the slightest difficulty in getting either oven heat or hot water with its use." The most fruitful result from the enquiry is the recognition on the part of certain local authorities and voluntary housing societies that, since one open fire per house must be conceded, steps should be taken to render the fire innocuous by fixing such grates as will readily consume smokeless fuel.

Now smokeless solid fuels are bulkier than coal, and need more storage room; and to the question, "has consideration been given to adequate storage accommodation for smokeless fuels?" only a few of the replies were in the affirmative. This, of course, is not surprising, for houses built with the aid of Government subsidy are limited in superficial area, and a large fuel store means space curtailed elsewhere. Moreover, only a minority of municipal tenants buy fuel in bulk. The majority buy in small quantities at frequent intervals. For these, regular delivery in such quantities or the possibility of buying coke at shops in their immediate neighbourhood are important considerations. In this regard the references in the report to Halifax and Widnes are much to the point. It is several years now since Mr. W. B. McLusky adopted the plan of increasing coke sales by making available supplies in 3d. bags and calling in the aid of grocers' shops in his area of supply. In addition to this he supplies coke in "standard" bags, delivered free throughout the area for the sum of 1s. 3d. Over a quarter of all the coke produced at the Halifax Gas-Works is sold and delivered in bags. The Widnes Undertaking supplies small broken coke in bags of 78 lb. at 10d. a bag, or in hundredweight bags at 1s. 3d. Then we have in mind the development of the smokeless estate at Chadderton, the success of which scheme is largely dependent on the co-operation of the Oldham Gas Department, which, because of the small storage space attached to the houses, guarantees deliveries of coke twice a week. As a further example we may refer to the speech of Mr. Henry Woodall at the annual meeting of the Ipswich Gas Light Company last week. He explained that there was an increasing demand for coke of graded sizes, and that for those consumers who have little storage space the Company supply coke in 1s. bags. Last year the Company sold 55,580 of these bags—a matter of 1,128 tons.

The report of the National Smoke Abatement Society indicates the scope which lies before our Industry as suppliers of both gas and smokeless solid fuel. In an editorial comment on the report in the Society's Journal

regret is expressed that so few authorities have properly tackled the question of the open fire. To reduce smoke from existing houses is a far more difficult task than to prevent it in new ones, and yet the number of smoke-producing houses is being added to every day. There should, we suggest, be further co-operation between housing authorities and gas undertakings. There exist effective means of combating the domestic smoke nuisance and at a total fuel bill no greater—in general, in fact, less—than that incurred when the fuel for the open firegrate is raw coal. Local authorities should be made more aware of these means, and they in their turn should impress upon the ratepayers the desirability of individual effort in promoting smoke abatement. They might to advantage follow the lead of the Uxbridge Urban District Council who decided to enclose a leaflet on the subject with its rate notes. We know that many local authorities have from time to time conducted smoke abatement propaganda, but this, we think, is the first time that such direct and complete appeal has been made. The report indicates certain of the trends of heating demand, and it is apparent that the Gas Industry, by modifying its sales methods to meet the conditions of this demand, can reap a rich harvest.

A Year of Progress

THE results of the working of gas companies throughout the country which are appearing in the "JOURNAL" week by week are exceedingly encouraging and something of a blow to those who, with wish father to the thought, would have it that the days of the Gas Industry are numbered. Let us take a look at what happened in Sheffield in 1936. During the year the quantity of gas sold for domestic and industrial purposes was 7,976 million cu.ft., representing an increase of 1,350 millions; and in addition a bulk supply of 354 million cu.ft. was sold to a neighbouring undertaking, making a total increase of over 20% on the previous year. A similar percentage increase was recorded at Swindon, while, on a much smaller scale, Heathfield shows an increase of 23%. These figures do not suggest an early demise of the Gas Industry. As Sir David Milne-Watson remarked at the annual meeting of the Gas Light and Coke Company, the reports of the Industry's death are grossly exaggerated.

Further north we see that the gas sold by the Newcastle Company during 1936 showed an increase of practically 10¾% on the previous year, which in itself was an increase of about 6¾% on 1934. Actually in three years sales have grown by 21½%. All classes of consumer—domestic, commercial, industrial, and public lighting—show increases in consumption; and while the largest increase has been for industrial purposes there has been an increase in 1936 of 6% in domestic sales, the more gratifying feature of which is an increase in the consumption per consumer, both prepayment and quarterly. This change is doubtless largely due to the Company's offering suitable tariffs to domestic consumers. There has been an increase of 402 lamps for public lighting in the Newcastle area, making the total 27,230, which is the third largest number of street lamps supplied by any gas undertaking in the Kingdom. Newcastle provides an example of what can be achieved by keen and persistent effort to retain and extend the public lighting load in face of strenuous competition. The Tottenham and District Gas Company was also able to present a bright story of public lighting progress. The Company has now three-quarters of the public lighting in its area of supply—a matter of 10,500 public lamps in 500 miles of street. Again, in his speech at the annual meeting of the Wandsworth and District Gas Company the Chairman mentioned that during the year the Wandsworth Borough Council had entered into a five-year contract with the Company for the improved lighting of 103 miles of road in the area.

Altogether the results which are coming to hand daily are most heartening, and this applies to the sales of both gas and coke. We may mention one or two figures as indicating the trend of progress. The Tottenham and Wandsworth Companies both report increases in gas sales of 5·3%, Croydon over 4½%, the South Suburban 5¼%, Woking 5·8%, both Barnet and Cambridge 6⅓%, Watford 7·6%, Romford nearly 10%, and Dudley and Brierley Hill nearly 14%. So we could go on, and it must be remembered that these increases have been gained at a time when electrical competition was fiercer than ever before. These and similar results should surely act as an incentive to future effort.

After the Fair

COMMENTING in these columns a fortnight ago on the Gas Industry Section of the British Industries Fair, we said that, while opinions still differ as to the value of our Industry's participation in the Fair, it was up to the personnel of the Gas Industry to reward with a full measure of support the efforts of the manufacturers showing at Castle Bromwich what is implied by modern gas service in the home, in industry, and in the field of public lighting. The Fair closed on Friday last; and those upon whom principally fell the responsibility for the very fine gas exhibit will doubtless by now have decided in their own minds whether or not the support accorded to them was an adequate return for the heavy expenditure of energy and money. At least it apeared to us that the official Joint Gas Conference was well attended, and the lightness of the programme enabled time which would otherwise have been spent by the converted listening to the converted in business session to be devoted to closer inspection of the appliances exhibited, several of which were shown for the first time. Again, the number of members of the Junior Associations and Salesmen's Circles who visited the Fair must have constituted a record.

Altogether the Gas Industry Section at Castle Bromwich must have been a source of encouragement to the personnel of the Gas Industry and certainly something of a revelation to the comparatively limited public who are able to see the Fair. More than ever before, we suggest, was the excellence of the finish of modern gas appliances brought out. We have developed a very high standard of showmanship; and the whole Section gave the impression of aliveness to modern requirements in home and industry. With a rising trade barometer optimism was abroad, and inspection of the displays could do no other than act as a tonic. Stimulated by the story of the past twelve months' progress in gas and coke sales and in appliances installed, and in the knowledge of the improved equipment available, we can surely go ahead in confidence with still more ambitious plans.

We described the individual exhibits in some detail in our special B.I.F. Number of Feb. 17, and we do not intend to particularize here except to hazard the opinion that the stand of the British Gas Federation, if it is to be regarded as the centre around which revolves the com-

posite exhibit of a whole industry, might well be made to stand out more superbly from the mass of its satellites. We realize, however, that in this matter so much depends not only upon personal taste, but upon the view which is taken of the function of the B.G.F. stand relatively to the whole. We appreciate also the difficulty of ensuring prominence without leaning towards the garish. Also, we think that the general colour scheme of the Gas Industry Section would have shown improvement had it been brighter; it was not sufficiently vivid. Another criticism which we have to make, and a more important one, concerns the small showing made of gas equipment for public lighting. In this respect our competitors were, so to speak, streets ahead of us. There was, for example, a massed exhibit of mercury vapour lighting in operation in the electrical section. Various patterns of lamp of differing capacity were exhibited at eye level, and the effect must have been distressing to surrounding exhibitors. Physically it was a painful display, but it was arresting, to say the least, and there were surprisingly many visitors to the Fair who obviously pay scant respect to their eyesight. We had no adequate reply to this glaring exhibit, which fact, considering to what extent gas is used for street lighting and what the load means to us, is passing strange.

The Gas Industry Section appealed to us as being more coherent than that of the electrical interests and as being more resplendent. Even so, it would be better if there could be greater definition of the various sections at Castle Bromwich. We appreciate the difficulties which confront the Fair Authorities in this regard, but the casual visitor must find the continuity of the stands—or, rather, the promiscuity of the sections—a little bewildering. True, there are explanatory signs attached to the roof members of the vast building at Castle Bromwich, but it may be queried whether these interior signs are adequate. The casual visitor wanders through a forest of pots and pans, along imposing arrays of fireplaces and surrounds, in and out of a labyrinth of cooking appliances and water heating equipment. Another step or so brings him to a collection of electric lamps or maybe a display of tubes of copper or iron and steel. The next moment he is confronted with, say, a British press in the best tradition stamping out tin lids with uncanny precision; the moment after he is poking his head into the cockpit of an aeroplane designed for those not too well blest with worldly goods. The point we would make is that some more pronounced segregation of the sections would be to advantage.

We were glad to notice in the Gas Industry Section at the Fair the manner in which the manufacturers have anticipated the supply of a low-sulphur or a sulphur-free gas by introducing new and pleasing designs of flueless heater which, from the combustion point of view, can be used with perfect safety. The attention which is being paid by the manufacturers to this field of gaseous heating is commendable, and it should lead to a real endeavour on the part of our Industry to supply gas of sulphur content as low as possible. These attractive appliances are in themselves sure to meet with public favour. They will be put into use; and if they are installed to operate on a high-sulphur gas the results will adversely affect the development of a heating load of the greatest value to our Industry. Let us then determine without delay to supply a gas which can be burned fluelessly, without causing the slightest discomfort due to oxides of sulphur. This is the most pressing problem before the Gas Industry to-day.

Personal

Mr. JOHN HYDE, Engineer, Manager, and Secretary of the East Grinstead Gas and Water Company, has been appointed a Director of the Company.

* * *

Mr. JOHN GRAYSTON, M.Inst.Gas E., has been appointed Engineer to the Romford Gas Company. Mr. Grayston served his articles under the late Mr. F. Thorpe at the Colne Gas Department, subsequently holding the post of Deputy-Engineer and Manager to the Hinckley Gas Department, and later to the Plymouth Gas Department. Nearly four years ago Mr. Grayston left Plymouth to become Chief Technical Assistant to the Lea Bridge District Gas Company.

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Mr. BERNARD F. BROWNE, eldest son of the late Mr. A. F. Browne, who was Chief Engineer of the Vauxhall Works of the South Metropolitan Gas Company, arrived in England last Friday from Brazil. Mr. Browne, who has been resident in South America for the past twenty-six years, is General Manager of the City of Santos Improvements Company, which controls various gas, electricity, and traction undertakings in Brazil. Mr. Bernard Browne's brother, Mr. P. E. Browne, is General Manager of the Brighton Company, while another brother, Mr. H. M. Browne, is with the South Metropolitan Company.

Obituary

There was a large congregation at St. Mark's Church, Surbiton, on Monday, Feb. 22, for the funeral service which preceded the interment of Mr. FRANK PACKHAM, by whose death local gas administration has suffered a loss. The name of Packham is, indeed, one that has been well known in the district, in connection with gas affairs, over a long period. For nearly thirty years, Mr. Packham had been a Director of the Hampton Court Gas Company, of which at the time of his death he was Deputy-Chairman. He was also a Director of the Walton-on-Thames and Weybridge Gas Company until quite recently, when the concern was taken over by the Wandsworth and District Gas Company. Mr. Packham, who died at the ripe age of 77 years, was uncle to Mr. Harry Packham, who will be remembered as having been Engineer to the Kingston-upon-Thames Gas Company at the time the undertaking was acquired by the Wandsworth Company. At the funeral service the Hampton Court Gas Company were represented by Mr. C. W. Kent (Chairman), Mr. C. T. Price (Engineer and General Manager), Mr. M. C. Lamb (Secretary), and Mr. F. C. Sloman (Auditor). Mr. Alfred Harrison represented the "JOURNAL." In addition to individual tributes, there were a number of wreaths from various organizations with which Mr. Packham was connected. The Chairman and Directors of the Hampton Court Gas Company sent one, while others came from the officials and staff, and the members of the Company. A wreath was also sent by the Berrylands Bowling Club, more than twenty members of which attended the service, mourning the loss of a fellow-member who had been a keen and greatly esteemed player.

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The death occurred last Sunday at his home at Purley of Mr. H. KEARNS, London Manager and Secretary of the Montevideo Gas and Dry Dock Company. Mr. Kearns had been in the service of the Company for over 52 years, having held the position of London Manager and Secretary since November, 1900. The funeral takes place to-morrow (Thursday).

Mr. Kearns is succeeded in the position of London Manager and Secretary by Mr. W. A. H. KEELEY, who was originally with the Wandsworth and District Gas Company.

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The death took place suddenly at the age of 75 of Mr. THOMPSON RAINE, Chairman of the Spennymoor and Tudhoe Gas Company.

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We deeply regret to announce that Mrs. P. S. HOYTE, of Nutley, Sherford Road, Elburton, Plymouth, died on Feb. 18. Her passing was peaceful, and the sympathy of their many friends is extended to those whom she has left bereaved.

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The death has taken place of Mr. PETER BLAIR, formerly Manager of the Haddington Gas Company.

It is interesting to record that the position of Manager of the Haddington Company has been held by members of the Blair family for more than half a century.

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We regret to announce the death, which occurred on Thursday, Feb. 25, of Mr. GEORGE ALFRED HARVEY, founder of the firm of Messrs. G. A. Harvey & Co. (Lon-

don), Ltd., the well-known sheet metal and steel plate workers. Mr. Harvey, who was 84 years of age, was Chairman of the firm until the time of his death.

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The death is announced of Mr. BERNARD G. HUTCHINSON, which occurred very suddenly at his residence, Bessecarr, Doncaster, on Feb. 14, after a short illness. He was 52.

Mr. Hutchinson was educated at the Barnsley Grammar School and the Sheffield University Engineering Department, and had been all his business life with the well-known firm of Hutchinson Bros., Ltd., of Falcon Works, Barnsley and Doncaster, Manufacturing Gas Engineers, and as Works Manager, General Manager, and Director since 1905. He was highly respected and will be greatly missed. He leaves a widow, one daughter, and one son to mourn his loss.

News in Brief

CURRENT EVENTS IN THE GAS INDUSTRY

An Extension of the existing limits of supply is among the objects of a Special Order Application for which the Sleaford Gas Company intends applying to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934.

Applications are Invited by the Lea Bridge District Gas Company for the position of Assistant Engineer and Manager at a salary of £600 per annum. Further particulars will be found in our advertisement columns.

Mr. Robert Sturrock, Engineer and Manager, Ardrossan Gas Department, took as his subject, "Coal—Its Uses and Abuses," when he recently addressed Ardrossan Co-operative Men's Guild in the Town Hall.

Applications are Invited by the Metropolitan Gas Company of Melbourne for the position of Assistant Engineer at a commencing salary of £1,250 per annum in Australian currency. Further particulars will be found in our advertisement columns.

For Sale by Tender the Directors of the Plymouth and Stonehouse Gas Light and Coke Company are offering ordinary stock to the amount of £90,000 (including premiums) at a minimum price of issue of £173 per £100 stock. The last day for receipt of tenders is March 12.

The Annual Report and Accounts of the British Legion reveal a very gratifying state of affairs. The Legion continues to grow and during the year under review (1935-36) it has increased at the rate of nearly 50 members a day. It is interesting to note that new branches have now been established at Cyprus, Rhineland, Rochester (New York), and Rouen.

Tokens Instead of Coins for insertion in prepayment meters was suggested in the annual report of Mr. James Christie, Chief Constable of Greenock, as a means to be taken by local authorities to prevent thefts from prepayment gas meters, which, he states, are specially prevalent among juveniles. These tokens could be sold at certain shops and other centres.

The Disposal of the Gas-Works at Thornton Cleveleys is no longer to be considered by the Council. Councillor R. Wright stated at the last meeting of the Council that this decision has been made after negotiations and investigations over a period of twelve months. There had been an offer from a gas corporation, which, however, had been considered inadequate. The Council had in mind schemes whereby they could improve and increase the sale of gas.

A New Use for Mr. Therm takes the form of decorations for chinaware, which has been specially made for use in the new demonstration room of the Stoke-on-Trent Gas Department. The B.C.G.A. will be glad to supply the name of the makers to any gas undertakings who are anxious to follow up this interesting development for their own demonstration room purposes. We do not know whether the idea is being extended to general production, but we can well appreciate the stimulating effect of Mr. Therm's cheery figure waving to us over the matutinal bacon.

Four Per Cent. Irredeemable Preference Stock is offered for sale by tender by the Directors of the Hampton Court Gas Company of such an amount as will with premiums produce a sum of £35,000. The minimum price of issue is £103½%, yielding at that price £3 17s. 3d.%. Tenders must be received before 11 a.m. on March 12.

A Breakdown in the electric current occurred in Cupar and district on the evening of Feb. 27, the stoppage being of brief duration. Candles were brought into use at the police office, and the local Territorial Hall, where dancing was in progress, was plunged into darkness. The breakdown also affected Auchtermuchty, Ladybank, and Leuchars.

Two Days Without Electricity has been the fate of no fewer than 60 Welsh towns and villages as a result of the recent storms, which damaged the overhead transmission lines. The result has been an almost complete "blackout" throughout Anglesey and large areas of Caernarvonshire, Denbighshire, and Flintshire. Many St. David's Day dinners in the Colwyn Bay district were held in candle light, while many cinemas and tramway systems were out of action. The B.B.C. announced on Monday that because of the failure in the power supply in North Wales, their Penmon transmitter would remain closed until Wednesday.

The Following Tenders have been accepted by the Stoke-on-Trent City Gas Committee in connection with the extension of the Etruria Gas-Works: Messrs. H. & T. Danks, Ltd., Netherton, supply and erection of three Lancashire boilers, four superheaters, two Weir pumps, and feed water heater; Messrs. R. & J. Dempster, Ltd., Manchester, 24 flanged lapwelded steel mains; Messrs. J. Ruscoe & Co., Ltd., Hyde, valves and supply and fixing of under-pressure connections; Messrs. G. Waller & Son, Ltd., Stroud, three sets of crankless gas compressors and two sets of 10-in. governors in duplicate with valves and connections; Newport and South Wales Tube Company, Ltd., 18 in. and 16 in. high-pressure bitumen covered steel mains and specials; Messrs. Stewarts & Lloyds, Ltd., Birmingham, steam pipes, specials, and fittings; Stanton Ironworks Company, Ltd., Nottingham, cast iron mains and specials and spun iron mains.

1937 "JOURNAL" DIRECTORY

Page 28. GUILDFORD. E. L. Nicholas appointed to Board.
Page 46. MIDDLESBROUGH. C. F. Blincoe, E. & M., deceased.
Page 56. READING. G. S. Dunster appointed S.
Page 56. ROMFORD. J. Grayston appointed E.
Page 64. STAMFORD. B. Clark appointed to Board.
Page 66. TAUNTON. Now styled "Taunton and District Gas Company."
Page 96. LURGAN. W. Tallentire, M.

Forthcoming Engagements

March.

4.—I.G.E.—Public Lighting Sub-Committee, 2.30 p.m.; Joint Lighting Committee, 3.15 p.m.
4.—MIDLAND JUNIORS.—Paper by H. Wynne (Burton-on-Trent).
9.—N.G.C.—Central Executive Board Meeting, 2.30 p.m.
10.—LONDON AND SOUTHERN JUNIORS.—Visit to Teape & Co., Paper Mills, Dartford.
11.—MIDLAND ASSOCIATION.—Annual General Meeting, Grand Hotel, Birmingham, 2.30 p.m.
12.—MANCHESTER ASSOCIATION.—Annual Luncheon, Midland Hotel, Manchester, 1 p.m. Mr. R. N. Webb will subsequently read his Presidential Address.
13.—SCOTTISH WESTERN JUNIORS.—Visit to Glenboig Brickworks.
16.—SOUTHERN ASSOCIATION.—General Meeting at Hotel Victoria, Northumberland Avenue, W.C. 2, 2.30 p.m.
17.—MANCHESTER DISTRICT AND YORKSHIRE JUNIORS.—Joint visit to Stanton Ironworks Company, Ltd., Derby. Paper by T. H. Wilson, "The Manufacture of Cast-Iron Pipes."
19.—LONDON AND SOUTHERN JUNIORS.—General Discussion Evening.

Amalgamation and Grouping

Newcastle-upon-Tyne and South Shields.

Application is intended to be made to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, by the Newcastle-upon-Tyne and Gateshead Gas Company with the object *inter alia* of empowering the Company to purchase the Undertaking of the South Shields Gas Company.

Reference to the proposed acquisition was made in the "JOURNAL" on Feb. 3. The merger has already received the approval of the shareholders of the Newcastle and South Shields Companies.

London Electricity Failure

Battersea Area Affected

An electricity failure caused considerable inconvenience in the Battersea district of London on Tuesday of last week, when the area was deprived of current for about twenty minutes. Street lamps, shops, cinemas, and private dwellings were affected, while traffic at one point was brought almost to a standstill as a result of the failure of the colour light signals. Battersea Hospital was in darkness for a short while until the emergency lighting was brought into operation.

It was stated at the Borough Council Electricity Works that the fault occurred in a reactor switch carrying the entire load at the generating station in Lombard Road. This was corrected within twenty minutes, and most of the district had its current restored. There was, however, further trouble at an automatic sub-station in the central area, which was affected for about another hour.

A Correction

"A New Protective Process"

Under this heading, on page 524 of last week's issue, we referred to a process for protecting metal work which was demonstrated by Poles, Ltd., at the B.I.F., Castle Bromwich. We regret that we erroneously stated that "Poles, Ltd., are handling the process in this country, while they also hold a number of overseas licences."

The actual position, as now pointed out to us, is that Poles, Ltd., have acquired an exclusive world licence for the use of this process in connection with poles and pole fittings from the proprietors, who are Messrs. Webb Metal Treatments, Ltd., Ulster Chambers, 168, Regent Street, London, W. 1. Poles, Ltd., also have in hand, by arrangement with the patentees, the negotiations for the general use of this process for certain overseas markets.

We regret any misconception which may have arisen from our previous statement.

Gas Light and Radio

An H.T. Supply Unit

The desire for an all-mains radio has often been the sole reason for the introduction of an electricity supply into the all-gas house of a satisfied consumer. The renewal of high-tension batteries with a radio capable of providing reception of adequate strength and quality becomes quite a costly operation when the receiver is in constant use. Moreover, it is found that high-tension dry batteries deteriorate and give unsatisfactory results for some time before they are actually due for renewal. It is not then to be wondered at that the all-mains radio has become so popular.

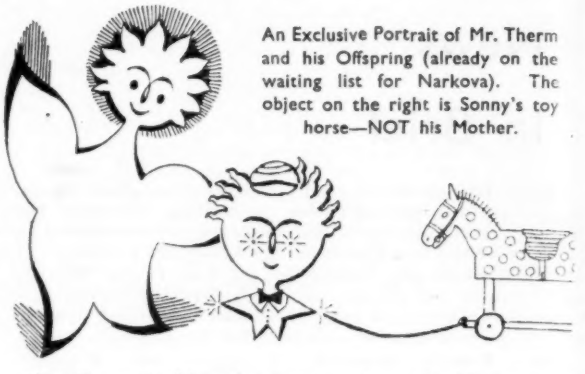
But any good battery-operated receiver supplied by a Milnes H.T. Supply Unit is claimed to be the equal of any all-mains receiver. Some of our readers will have noticed the firm's recent advertisements in the National Press; indeed, numerous letters have been received by Milnes Radio Company, Ltd., Victoria Works, Bingley, from gas managers complimenting them upon the theme of their advertisements and offering to co-operate by bringing the Milne H.T. unit to the notice of their consumers.

The firm state that dry batteries cannot be expected to serve for long. They give out current but they do not recharge. A Milnes Unit is just as good as having a new dry battery every day because it starts each day fully-charged and at full voltage. It is claimed to be the only high tension battery in the world which *recharges automatically from the low tension accumulator.* It will give years and years of trouble-free service at an all-in running cost of 3d. or 4d. a week.

It's a Boy

Mr. Therm a Proud Father

The birth is announced from Eastbourne of a son and, presumably, heir to the radiant attributes and popularity of his father, Mr. Therm. The new arrival is announced in the sales literature of the Eastbourne Gas Company rather in the round tones of the ringmaster at a circus as "Sonny Heat, the Charming Son of the Famous Mr. Therm."



An Exclusive Portrait of Mr. Therm and his Offspring (already on the waiting list for Narkova). The object on the right is Sonny's toy horse—NOT his Mother.

Details are lacking, however, and we should very much like to know the exact day and hour of Sonny's arrival so that we could consult our astrological correspondent, who might then divine what the future holds for the frail bairn. Of course, if Sonny inherits only the qualities of his father his future is assured, but what of the distaff side—an absolutely unknown quantity? Or is the birth the fortuity of an overworked stork?

At all events, Mr. Therm appears in the Company's sales literature as the traditionally proud father, with one fin lovingly caressing the youngster's woolly head. Beyond doubt he will make a good father and Sonny will receive an excellent home training and so will be quite fitted to take up the reins of office when (distant be the day) his beloved father has "shuffled off this mortal coil."

Shadows in Industry

Where Uniform Light Diffusion is Not Effective

Although the illuminating engineer generally strives to minimize shadows in general lighting, experts have found that there are visual tasks for which a directional light, producing shadows, is necessary.

In a lecture before the Illuminating Engineering Society on Tuesday, Feb. 23, Mr. Howard Long revealed that the British National Illumination Committee had listed a number of processes in which some degree of shadow is essential. These included: Inspection of cigarettes for filling; production of Braille books; marking and inspection of steel rules; classifying garments in laundries; engraving; file-cutting; typesetting; and in many processes where it is desired to see irregularities.

Special Area Commissioner on Coke Oven Gas Supply

Glasgow and Gas Grid

The benefits which would accrue to Glasgow and the surrounding Special Areas from the City's acceptance of gas supplies which would help the pig iron industry were pointed out by Sir David Allan Hay, Commissioner for the Special Areas of Scotland, when he spoke at the annual dinner in Glasgow on Feb. 26 of the Scottish Building Contractors' Association.

Emphasizing that he was not prejudicing the decision of the Corporation, Sir David uttered a warning as to the ultimate possibility of the Industry disappearing from the West of Scotland. With regard to the community of interest between Glasgow and the Special Areas outside, he felt that one of the most hopeful lines of practical assistance which had turned up within recent times was contained in a report by a Board of Trade Committee on the gas grid or rather on the gas supplies in the West of Scotland.

If Glasgow could see its way to take that gas supply it would add to the men engaged in the pig iron industry, and would make the City a more attractive place to industry by means of cheaper gas.

Fine Gas Display at Watford "Brighter Homes" Exhibition

The imposing stand of the Watford and St. Albans Gas Company situated opposite the main entrance of the "Brighter Homes" Exhibition, held recently at Watford, was generally conceded to be the most attractive in the Exhibition. Its simple modern lines showed to the best advantage the gas appliances displayed. These consisted of a range of 'Ascot" gas water heaters on one side and "New World" cookers, "High Beam" fires, and other Radiation apparatus on the other. Cookery Demonstrations were given on the stand by Miss Irene Brooker, of the Company's Home Service Bureau, and over 100 entries were received in a Cake Baking Competition held in connection with the Exhibition. Another interesting feature was an all-gas kitchen designed and installed by the Company.

Two Sections of the Watford Company's Exhibit.

Drakes, Ltd., Halifax

Annual Report of the Directors

The thirty-fifth annual report of the Directors of Drakes, Ltd., Halifax, for the year ended Dec. 31, 1936, states that the profit for the year as shown by the accounts is £5,119, and the Directors recommend that this sum, together with the amount of £3,575 brought forward from last year, be carried forward to next year's accounts. The Directors report that the improvement in trade has been maintained during the year, and in their opinion, the prospects for the current year are distinctly favourable, although the question of obtaining deliveries of raw materials in reasonable time is now causing them some concern.

At the forthcoming General Meeting the Members will be asked to confirm the appointment to the Board of Mr. Henry Smith, who joined the Board during the year at the invitation of the Directors, and who has been appointed Chairman of the Company.

Built-in Refrigerators

Information for Architects and Builders

It is well known in the Gas Industry that great advances are being made in the planning of kitchens. Women are demanding better equipped, better planned, and more attractive kitchens; architects and builders are anxious to meet the demands of the public who will rent or buy the houses and flats they design and build.

The relatively smaller space allotted to the kitchen in many houses and flats has made built-in equipment popular because it is convenient and space-saving. Publicity campaigns are increasing the demand for refrigerators, and architects and builders if they are made aware of the ease and convenience with which gas refrigerators can be installed are in a position to influence the adoption of gas models on a large scale.

The British Commercial Gas Association has, therefore, co-operated with Electrolux, Ltd., in the production of a series of four "Information Sheets" designed to give the necessary technical information to architects and builders for the installation of such refrigerators. These sheets are appearing in the *Architects' Journal*, and reprints are available for members to distribute to architects and builders in their areas. A set of these sheets supplied to each architect and builder in the member's area will not only impress upon them the adaptability and convenience of gas equipment, but will ensure that the refrigerators will be correctly installed to give the greatest satisfaction in use. Reprints of the set of four sheets are available at the price of 10s. per 100 sets, or 1s. 6d. per dozen sets.

The Premier Commends Trading Estate

£1 a Week Factories

St. David's Day, March 1, was chosen for the publication of a survey, with a foreword by the Prime Minister, of the industrial potentialities of the Treforest Trading Estate in the South Wales Special Area, between Cardiff and Pontypridd.

"I commend the Treforest Trading Estate to the consideration of all those who contemplate the expansion of business," Mr. Baldwin writes.

The Trading Estate, which is a Government-aided effort to attract new industries to Wales, does not operate for profit, so that rents for factories are expected to be low. The survey, in novel make-up with maps and photographs, emphasizes that the site is one which should appeal to manufacturers on the grounds of: Low capital costs; ample and cheap supplies of coal, gas, electricity, and water; labour which is already housed, healthy, and adaptable; transport by road, rail, canal, and sea; and substantial local markets for goods in addition to good geographical position for the markets of the Midlands and the South.

It is hoped to have three factories ready for occupation by May. The aim is to grant facilities to everyone from the firm employing thousands of hands to the small man who can have 1,500 sq. ft. of space for £1 a week. Paper making and the construction of steel mesh for concrete are industries for which factories are already being built.

Athletic and Social

Cardiff Athletic and Social Club.

The Sixteenth Annual General Meeting was held at the Carlton Restaurant on Saturday, Feb. 27, 1937. The meeting was followed by dinner. A programme of musical items was presented after dinner.

The report of the Council for the year ended Dec. 31, 1936, stated that the accounts disclosed a profit after providing for the full requirements of the various athletic and social sections. The athletic side had been well catered for and successful seasons had been enjoyed by the following sections: Association Football, Cricket, Harriers, Lawn Tennis, Bowls, Skittles, and Air Rifle. The Harriers were again entrusted with the promotion of the Cross Country Novice Championship. The H. D. Madden (Challenge) Cup was secured by Bute Terrace Works, and the H. D. Madden (Bowls) Challenge Cup by Mr. J. Smith, Bute Terrace Works. Social activities under the direction of the Entertainments Committee had included the Annual Ball, monthly whist drives, and Children's Christmas Treat. Gifts to pensioners at Christmas-tide were made as on former occasions.

Gas as an Aid to Health Culture

One of the *Salons*, showing the Radiator Grills just below the Window Sills.

An interesting example of the important part gas can play in the provision of the exacting heat requirements of an up-to-date beauty parlour and health culture centre.

Central Heating Installation at Elizabeth Arden's

Some women are born beautiful: others have loveliness thrust upon them—by Elizabeth Arden, and other establishments of a similar purpose. Elizabeth Arden is, we believe, a name to conjure with in circles where all forms of beauty treatment from the removal of what is inelegantly described as " adipose tissue " to the provision of a completely new face occupy a dominating position in my lady's scheme of things.

A peep into these forbidden precincts—dedicated solely to the beautification of womankind and bearing, so far as the mere male is concerned, all the sanctity of a convent—provides a glimpse into a sphere of activity of which the majority of our readers are (we hope) innocently oblivious. Picture luxurious suites of richly furnished and softly carpeted *salons*, artistically draped hangings, decorations of a fascinating and colourful motif, glittering showcases and glass-topped tables carrying countless enticing little bottles, boxes, and jars of exquisite scents, elysian balms, and weird exotic perfumes, tastefully equipped cubicles for treatment of the human body in manners such as the Spanish inquisitors seldom dreamed of, airy exercise rooms where every recalcitrant muscle can be brought into tune, inviting rest rooms where staff and clients may recuperate after their exertions, the whole pervaded by an atmosphere of quiet dignity and businesslike efficiency—and you have but an inadequate conception of what the Bond Street premises of Elizabeth Arden stand for, and of what our womenfolk are willing to go through in the sacred cause of beauty.

And behind all these—shall we say?—superficial embellishments lies the story of the work done and the conditions under which it is carried out—the need for accurate, unvarying, and trouble-free heating; in short, the story of how gas was found to be the only really practical solution of a peculiarly difficult heating problem.

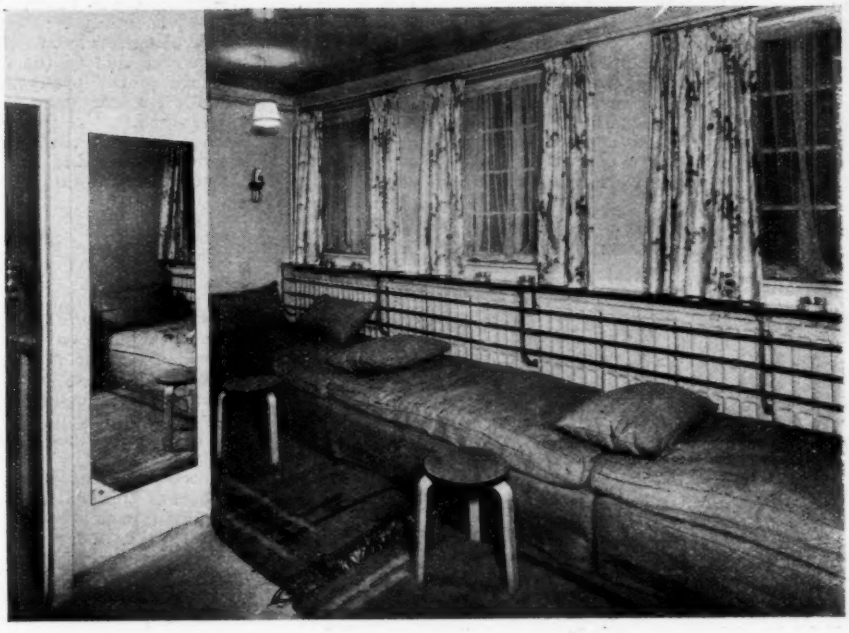
Some fifteen years ago—in the spring of 1922—the French-cum-American firm of Elizabeth Arden came to the conclusion that the ladies of London were in need of the expert services which this firm could provide, and accordingly opened a branch, occupying the first and second floors, at 25, Old Bond Street, W. 1.

Need for Efficient Heating.

Now in a business of this nature the question of efficient warming throughout the premises—and in particular, we presume, in the rooms where certain treatments require the minimum of bodily covering—is one of paramount importance. The premises were, however, quite inaccessible for the entry of solid fuel or the disposal of ashes, with the result that gas was the obvious choice, the installation being provided by Thomas Potterton (Heating Engineers), Ltd., of Balham. At that time, as we have said, the business extended over two floors only, on the lower of which a small chamber was set apart for the gas boilers which supplied the domestic hot water and the central heating—merely a large cupboard in which cleaners' utensils and other staff equipment were housed. On each floor twin No. 20 " Victor " boilers were installed, with 300 sq. ft. of radiator heating surface fed by overhead circulation on the " drop " principle in the case of the lower floor and by a standard up-feed system on the upper. An air thermostat of the capsule type, with tripod, was provided for regulating the heat, this being fitted in the office.

In the autumn of 1926 the form of treatment provided by Elizabeth Arden had become so popular that the business was extended to two further floors above, these being heated in a similar manner to the original floors with over-

The Manageress uses this Consulting Room.



The Staff Rest Room, with Panel Radiators behind the Divan and the remote Control Air Thermostat on the Wall below the Light.

head circulation supplying wall and column type radiators at convenient positions.

Two years later the demand upon the premises had grown to such an extent that it was found necessary to dispense with the office and the principal heating chamber on the lowest floor, and accommodation had to be found elsewhere for the boiler plant. This in itself presented a serious problem; there was no available space in Elizabeth Arden's portion of the building, while the whole of the ground floor was occupied by another firm. It was finally decided to utilize a vault under the roadway as the heating chamber, and in place of the original separate No. 20 units one "R" series "Victor" boiler of seven sections and having a capacity of 120,000 B.Th.U. per hour was installed, with a main circuit carried through the entrance hall at ground floor level and connected to the horizontal services on the first and second floors. The third and fourth floor heating equipment remained unaltered, the former being supplied by a boiler fixed on the wall of the kitchen on the second floor, where it is working as efficiently to-day as it was when installed fifteen years ago.

The hot water supply, consisting of a lagged storage set with twin No. 20 "Victor" boilers, also had to be removed to the vault and the secondary circulation extended to the original position, where the pipes were connected up as in the case of the central heating system. The storage tank is of 75 gallons capacity, and the boilers are controlled by capsule thermostats.

This installation continued to give every satisfaction, and when, during the summer of 1936, further extensions to the premises were undertaken instructions were given to Messrs. Potterton to deal with the heating of the new section.

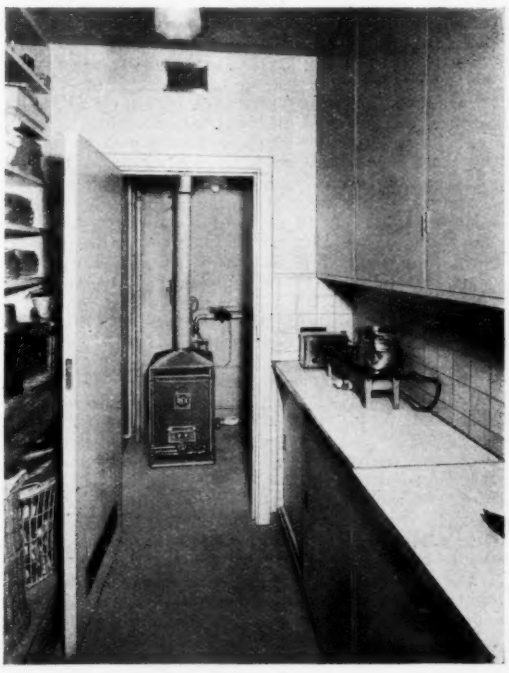
Latest Extensions.

The latest extension consists of a completely re-constructed building at the rear of the main premises, comprising a consulting room for the Manageress, together with an addition to the main *salon* on the first floor and further treatment cubicles in conjunction therewith, while on the floor above a staff rest-room, cashier's office, and kitchenette were provided.

This new section is remote from the circuit of the main heating system, and in order to avoid disturbance of the existing premises a separate installation was planned. On the first floor, where the principal rooms are situated, the provision of a suitable boiler room was out of the question. Accommodation was therefore found for it on the second floor of the new section, adjacent to the kitchenette, and in this position a No. 1 series "Rex" boiler of two sections, having a capacity of 66,000 B.Th.U. per hour, was fitted, supplying 333 sq. ft. of radiator area throughout the various rooms. The system on the same floor as the boiler is operated on the overhead gravity principle, while an electrically-driven accelerator alongside the boiler serves to pump the water through the circuit on the floor below. Should the electric power fail no worse consequences can arise than the cessation of circulation on the first floor, that on the second floor, of course, being unaffected.

The low-pressure system best meets the case in heating installations such as this, and the water is circulated as a maximum temperature of 150° F. It will be appreciated that a fairly high temperature is desirable in the staff rest room, where the masseuses go after carrying out their energetic duties in the heat of the treatment cubicles, and the radiators are here arranged to give a temperature of 70° F. The temperature in the other rooms and *salons* is normally maintained at about 65°, although there is a margin of boiler power to exceed these figures if necessary. A remote control air thermostat is provided in the rest room to maintain uniform temperatures in accordance with these requirements. All these additions and alterations to the heating plant were effected without disturbance of the firm's business.

Special mention must be made of the radiator arrange-



The "Rex" Gas Boiler which serves the New Section of the Premises.

ments in the *salons*, where it was essential to conform to the decorative treatment of the rooms. This has been admirably achieved by positioning the radiators in recesses below the windows and concealing them behind wooden panels with air inlet appertures at the foot and metal grills at the top. Thus the cool air enters underneath, passes over the radiator surface, and is ejected in the form of a warm stream through the grills above. The extremely comfortable temperature conditions throughout the whole building are particularly noteworthy, all the rooms being agreeably warm without a hint of stuffiness—which, as has been emphasized—is an important consideration in premises such as these. Indeed, the management have expressed themselves as completely satisfied with the excellent heating service which has been provided, and congratulations are due to the contractors for showing one more instance of the pre-eminent suitability of gas heating in difficult circumstances.

The Architect of the new section of the premises was Mr. Sidney Parvin, F.F.A.S., of 20, Mount Street, W. 1, while the decorations and furnishings were executed by Messrs. Turner, Lord, & Co., of the same address.

The Gas Industry and the Increase in the Cost of Coal

Institute of Fuel Informal Discussion

An informal meeting of the Institute of Fuel was held at Gatti's Restaurant, Strand, on Feb. 19, when some interesting views were expressed, concerning the position of the Gas Industry in relation to the manner in which coal users are being forced to take such supplies as they are permitted and not what they require for efficient operation. Lord Strabolgi was in the chair, and the subject debated was " Is an Increase in the Price of Coal Justified in the National Interests? "

Mr. Aneurin Bevan, M.P., spoke first in justification of the increase in the price of coal and the methods which are being adopted to ensure that increase. His argument was on the general grounds that the coal industry had got into such an unhappy financial condition due to causes over which it had no control that the only thing to do was to increase the price of coal and control the coal industry in the manner which is now being done, if the private capitalist system was to continue. He implied that the alternative was nationalization of the mines, but did not discuss it in detail. Indeed, he gave no hint as to how nationalization would have assisted the coal user in a different way from that now being complained of, and, put briefly, his argument really was that he was satisfied that what the Government has done was the only thing that could have been done, and he threw the onus on his opponent in the debate—Mr. E. C. Evans, Hon. Secretary of the Institute of Fuel and Director of Research of the British Iron and Steel Federation—to suggest a better way.

Mr. Evans, however, did not take up the challenge in the way that Mr. Aneurin Bevan probably hoped, but based his argument against the increase in the cost of fuel on the general grounds that increases in price inevitably hamper sales and result in a lower demand, and, at the same time, stimulate strenuous efforts to reduce the amount of coal for a particular purpose. In support of this he mentioned the reduction of the amount of fuel now used per ton of steel and also per kilowatt of electricity generated as instances of what may be expected following the increase in the cost of coal. Industrial experience, said Mr. Evans, showed that the prosperity of an individual industry was dependent on high outputs and the lowest price, having regard to the cost of production. He admitted that probably what he called the service industries —*i.e.*, gas, electricity, railways, and shipping, could better stand an increase in the cost of coal than the productive industries, and recalled it had been said that an increase of 1s. per ton of coal would amount to two-thirds of a penny per 1,000 cu.ft., or an average of 1s. 8d. per consumer per annum, assuming that the whole of the increase was borne by the sales of gas and no advance was made in the price of coke or by-products.

The most interesting views from the standpoint of the Gas Industry, however, were expressed in the subsequent discussion and we give a note of these below although, in accordance with the rules for reporting these debates, the names of the contributors, after the opening speakers, must not be mentioned.

On the anti-gas side were some remarks based upon figures taken from a recent issue of the " GAS JOURNAL " in which the dividends of a number of gas companies were announced—and the speaker in question, after commenting on the satisfactory nature of the dividends and expressing the view that the increased cost of coal could be passed on to the consumer, quoted from the Swansea Company's annual report in which it was stated that the price had been increased owing to the increased cost of coal, and that the increase had been accepted by the consumer practically without comment.

Coming to the comments made from the point of view of the Gas Industry—and the speakers prefaced their remarks by saying that the Industry wanted the coal industry to have a price which would permit of paying fair wages to the miners and finance the introduction of efficient machinery into the mines as well as paying a reasonable dividend—stress was laid upon the voluntary agreement on the part of the Gas Industry to an increase in existing contracts, an unprecedented step demonstrating that the Industry desired to help the coal industry. It was strongly complained, however, that a good deal of the troubles of the coal industry are due to bad salesmanship.

Again, it was strongly complained that users in the Gas Industry are being compelled to take coal from certain districts irrespective of whether it suits the plant or not. There was now no liberty of selection of the coal in any way, and no account was being taken of the fact that, although a certain coal had been purchased in the past, new plant had since been put in and another coal was necessary.

Another matter to which attention was drawn was that when a contract for coal for gas purposes came to an end in point of time, there was usually a certain quantity still remaining over for delivery, but for some reason or other the policy now was to cancel those outstanding quantities and put all future deliveries on a higher price.

An instance of the operation of an increased price of coal was also mentioned. In a certain depressed area with a large number of miners unemployed there is a gas-works making water gas and coal gas. It was intended to make all coal gas, and for that purpose another 10,000 tons of coal were needed. The coal supplier said he could meet the demand at an increase of 2s. 5d. per ton. That increase was agreed to by the gas interests, and the supplier said he would have to get permission from the Coal Control Board. But the supplier came back and said the Coal Control Board required an increase in price of 4s. per ton notwithstanding that the colliery and the buyer were satisfied with 2s. 5d. The consequence was that the extra 10,000 tons of coal had not been bought and water gas was continued to be made. Therefore, the coal industry had, as the result of high prices, been deprived of the sale of 10,000 tons of coal, and the gas company would import oil and make water gas.

Yet another feature brought out from the gas side was that an increase in the price of coal was not the only thing to be considered, because immediately the price of coal was increased all the raw materials of the industry were also increased in price because of the influence of the higher cost of coal on their production. Further, it was contended that increases in the price of gas through higher coal prices will inevitably have the effect that the public will use less gas and then the Gas Industry will require less coal.

Aberdeen to Improve Supply

Extension of High-Pressure Main

A £13,500 scheme for the improvement of Aberdeen's gas supply by the extension of the high-pressure main was approved by the Gas Committee of the Town Council on Feb. 25.

The Department recently carried out a scheme for the laying of a high-pressure main from Gallowhill through the City to the corner of Ashgrove Road and Westburn Drive, from there to Great Northern Road, and then southward to Albyn Place. The scheme was completed in December, and it was reported that it had proved effective in maintaining an adequate supply through the western and northern areas of the City. It was agreed to recommend that the high-pressure main should be extended along Ashgrove Road to Anderson Drive and then to the Bridge of Dee and Riverside Drive.

If there is sufficient demand the Department's area of supply may be extended to Culter. At present the mains extend to Mannofield.

Metropolitan and Suburban Companies' Results in 1936

A comparative statement of working results and revenue account costs per therm sold.

Compiled by MR. E. COWEE, Accountant to the Commercial Gas Company

	Gas Light	So. Metrop.	Commercial	S. Suburban	Wandsworth	Tottenham	Croydon	Lea Bridge	Hornsey
Declared Calorific Value ... ... (B.Th.U.)	500	560	500	560	500	500	500	500	500
Gas Sold on Declared Calorific Value ... (therms)	266,210,088	82,663,497*c*	15,703,415	26,714,748	30,812,581	21,952,190	16,363,847	5,438,412	4,115,848
Increase ... ... (per cent.)	3·69 *a*	*Dec.* 1·10 *f*	*Dec.* ·59	5·33	4·87	5·28	4·56	4·45	3·54
Gas made per ton Coal on Works Tests (therms)	75·55 *b*	75·37	73·415	73·89	78·09	78·30*b*	77·25*b*	82·44	68·19
,, unaccounted for ... ... (per cent.)	4·32	—	3·65	6·25	5·04	6·58	6·81	4·53	1·53
Coke made for Sale per ton Coal ... ...(cwts.)	10·22	9·50	10·50	10·03	9·10	9·23	10·21	9·95	11·05
Tar made per ton Coal ... ... (galls.)	10·33	10·75	10·32	10·63	11·06	12·47	12·64	16·27	10·70
Liquor made per ton Coal ... (galls.—8 oz.)	34·84	41·01	37·64	32·16	25·35	13·92	41·56	41·98	33·60
Percentage of Coke used as Fuel	19·44	19·90	19·21	21·13	25·55	24·22	17·35	22·44	15·00
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
CAPITAL EXPENDED (less nominal additions) per therm sold	2 0·38	1 9·64 *g*	2 1·74	2 5·56	2 7·60	1 9·75*k*	2 3·68	1 10·02	1 10·41
CAPITAL EMPLOYED per therm sold	3 3·99	2 6·49 *g*	3 8·27	2 10·20	3 5·54	2 2·28*k*	2 10·24	2 0·59	2 6·63
	d. d.	d. d.	d. d.	d. d.	d. d.	d. d.	d. d.	d. d.	d. d.
Price of gas per therm in principal area ... ... { L'day, Mid. ...	8·6 8·7	8·75 8·75	9·0 9·0	9·5 9·5	8·0 8·2	8·6 8·6	9·0 9·1	8·4 8·4	8·0 8·0
Michs, Xmas ...	8·7 8·7	8·75 9·00*h*	9·0 9·0	9·5 9·5	8·2 8·2	8·6 8·6	9·1 9·1	8·4 8·4	8·0 8·0
COSTS PER THERM SOLD									
Revenue Accounts.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Coals, Oil, etc.	3·30	3·30	3·85	4·21	3·50	4·11	3·94	3·88	4·79
Less Residuals :—Coke and Breeze	1·74	1·72	2·25	1·87	1·80	1·91	2·00	1·68	2·50
Tar	·42	·41	·51	·35	·42	·64	·55	·50	·57
Amm. Liq. and S. of Amm.	·01	·05	·09	—	*Dr.* ·05	·08	·03	·01	·02
TOTAL RESIDUALS ...	2·17	2·18	2·85	2·22	2·17	2·63	2·58	2·19	3·09
Net for Coals, Oil, etc. ...	1·13	1·12	1·00	1·99	1·33	1·48	1·36	1·69	1·70
MANUFACTURE—									
Salaries	·15	·22	·22	·17	·16	·20	·18	·09	·15
Wages—Carbonizing	·31	·50	·60	·44	·41	·38	·28	·38	·43
Purification	·06	·17	·10	·09	·12	·11	·05	·03	·10
Repairs: Plant	1·06	1·28	1·16	1·12	1·52	1·60	1·35	1·18	1·06
Net Manufacture ...	2·71	3·29	3·08	3·81	3·54	3·77	3·22	3·37	3·44
DISTRIBUTION—									
Wages and Salaries	·77	·44	·44	·87	·48	·41	·57	·14	·29
Repairs—Mains and Services, etc.	1·19	·80	·51	·97	·55	1·85	·98	·50	·46
,, Meters and Prep. Meters and Fittings	·40	·77	·87	·89	1·09	·61	·43	·38	·53
,, Stoves—Ordinary and Prep.	·95	·90	1·25	·89	·65	·46	·83	1·47	·48
TOTAL—Net Manufacture and Distribution ...	6·02	6·20	6·15	7·43	6·31	7·10	6·03	5·86	5·20
Rents, Rates and Taxes	·60	·35	·37	·28	·28	·43	·63	·54	·26
MANAGEMENT—									
Directors, Auditors, and Salaries (Secretary, etc.)	·11	·16	·19	·20	·18	·16	·20	·22	·36
Collectors	·18	·19	·26	·13	·12	·19	27	·15	·08
Stationery and General Charges	·14	·22	·22	·18	·23	·20	·29	·32	·28
Copartnership	·11	·10	—	·14	·21	·19	·20	·15	·15
Bad Debts	·02	·02	·01	·02	·03	·00	·01	·01	·03
Law and Parliamentary Charges	·01	·01	·01	·01	·01	·01	·00	·01	·00
Superannuations, Pension Funds, etc.	·23	·19	·30	·33	·24	·19	·37	·26	·49
National Insurance	·08	·29 *i*	·08	·08	·08	·10	·05	·07	·07
Sundries	·00	·00	·01	—	·01	—	·00	—	—
TOTAL EXPENDITURE (*less* Residuals)	7·50 *c*	7·73	7·60	8·80	7·70	8·57	8·05	7·59	6·92
Gas (less Public Lighting Expenses)	7·73	7·90	8·07	8·87	8·12	8·26	8·72	7·82	7·67
Rentals—Meter and Prep. Meter and Fittings...	·80	·70	·63	·79	1·00	·55	·55	·46	·52
Stove	·85	·59	·83	·94	·64	1·19	·75	94	39
Miscellaneous	·06	·02	·03	·02	·03	·03	·25	·00	·04
TOTAL—Gas, Rentals, etc.	9·44	9·21	9·56	10·62	9·79	10·02	10·27	9·22	8·62
Balance being Profit	1·94	1·48	1·96	1·82	2·09	1·45	2·22	1·63	1·70
Dividend and Interest	1·84	1·56	2·00	1·79	2·15	1·44	1·96	1·54	1 52
Surplus or Deficit	·10	*Def.* ·08	*Def.* ·04	03	*Def.* ·06	·01	·26	·09	·18
Contributions to Funds and Sundry Payments ...	·03 *d*	—	—	—	*Cr.* ·02	·00	·22	09	·14
Sundries.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coals cost per ton	20 7·93	20 5·58	21 6·99	23 11·72	21 4·79	24 8·82	25 1·97	26 6·37	27 9·00
Coke realised per ton Coal	11 2 02	10 5·69	12 1 48	12 6·92	10 9·57	11 3·06	13 3·64	12 9·98	15 1·39
Coke ,, ,, Coke	21 10·33	22 7·90	23 6·53	24 6·59	23 8·66	24 1·97	25 6·92	25 8·27	27 4·30
Breeze ,, per ton	4 4·61	2 4·93	6 0·20	5·24	8 8·74	5 7·80	7 4·96	8 8·54	—
Tar ,, per gall.	3·28	2·87	3·30	2·64	2·39	3·85	3·24	2·68	3·83
Amm. Liquor, etc., realised per butt (8 oz.)...	3·54	9·54	1 6·14	—	*Dr* 1 2·94	3 10·88	7·27	2·90	5·15
Percentage of Stoves at Rental to Consumers ...	88	105	101	80	61	88	57	50	22
Bad Debts per cent. on Total Receipts	16	·14	·10	·17	·23	·03	·08	·12	·21
Net Profit per cent. on Ordinary Capital	6·16	5·07	4·87	6·23	6·40	6·82	9·19	9·36	7·46
One-fifth Penny variation equals Gross	£204,555 *a*	£83,476 *j*	£16,053 *j*	£26,968 *j*	£23,573 *a*	£18,293	£13,246 *a*	£4,532	£3,292*a*
Water Gas per cent. on Total Make of cubic feet ..	11·75	—	10	—	6·18	14·09	20·50	17·49	16·06

E. C.—28-2-37.

a—On Gas charged to Consumers.
b—Before Benzol extraction.
c—Excluding Exs. re issue of Stock
d—Less Grant from Treasury.
e—Including Sales to South Suburban.
f—Excluding Sales to South Suburban.
g—Eliminating purchase of South Suburban and Commercial Stocks.
h—From 17th October, 1936
i—Including Copartnership Insurance Fund.
j—One farthing variation on gas charged.
k—Including Investments in other Gas Companies

The Joint Gas Conference at the Fair

Feb. 23 to 25

Official Welcome TO THE Delegates

THE EARL OF DUDLEY, M.C.,
President of the British Gas Federation.

The Earl of Dudley presided at the Joint Gas Conference which opened at the British Industries Fair at Castle Bromwich on Tuesday, Feb. 23, under the auspices of the British Gas Federation.

An official welcome was given to the delegates by the Lord Mayor of Birmingham (Alderman Harold Roberts) and the President of the Birmingham Chamber of Commerce (Mr. G. Philip Achurch). Those present included Sir David Milne-Watson, Sir Russell Bencraft, Alderman J. H. Lloyd (Birmingham), Councillor Jackson (Manchester), Mr. Stephen Lacey, Mr. Will Thorne, Mr. F. B. Richards, Mr. R. G. Shadbolt, Mr. A. W. Smith, and others.

The LORD MAYOR offered a cordial welcome to the Earl of Dudley and to the members of the Conference. It was important, he observed, that all sections of the Industry, producers, plant manufacturers, and consumers, should be brought together in one Conference. He understood that had been achieved that day because they had present representatives of the gas making side and representatives of the gas using side. "It seems to me," he said, "in these days when the utmost use should be made of coal, your work is of the utmost possible national value."

Progressive Development.

Mr. PHILIP ACHURCH, who also welcomed the delegates, said it was not surprising that, as the Gas Industry had developed so progressively, the section at that Fair was larger than ever. The many exhibits showed that it was keeping well abreast of modern requirements, particularly in the heat treatment of metals. The results of keen scientific research were evident in a great deal of the equipment displayed. As President of the Birmingham Chamber of Commerce he was very glad to welcome them that day and he would wish the Conference every possible success. Birmingham was a "gas proud" city, justifiably, perhaps, as it had the largest municipal gas undertaking in the world. This perforce reflected the ability of the officials who were connected with it and who took a prominent part in promoting that Conference.

The EARL OF DUDLEY, in acknowledging the welcome, said he had been gratified by what had been said about the gas exhibit at the Fair. He thought no one who had had an opportunity of viewing the exhibits would deny that great strides had been made even during the last twelve months in the Industry. "I think," he said, "it can be rightly claimed without fear of contradiction that the Gas Industry does supply the needs of the general public in the fullest and most economical way. They were very grateful to the President of the Chamber of Commerce and to the members of the Council for the opportunity to come to the Fair and to show their customers the progress that the Industry was making. They were grateful to the Lord Mayor for helping them in their work.

Presidential Address

Of the Rt. Hon. The Earl of Dudley, M.C.

At most Conferences the President acts as compere to a number of other speakers. This is not the case to-day. The Presidential Address is the only speech on the programme. The rest of our time will be spent in bringing ourselves up to date with all the new inventions that have been assembled in the Gas Industry Section of the Birmingham Fair. As the Gas Section is bigger and more representative than ever before, our time will be fully occupied.

When I addressed you last year, I confidently predicted a period of growing prosperity for the British Gas Industry. I can now claim to have proved myself a true prophet.

Mr. Therm worked overtime in 1936. He added a quarter of a million new customers and brought the total number of gas users to well over eleven million. The sales of gas increased by 10,000 million cu.ft. This represents more than 3% of the total sales of gas, and is equal to the annual gas consumption of the whole city of Glasgow.

The annual figures for gas sales are regarded as a fair index of the country's economic condition. This is because the Gas Industry touches the national life at so many points. Gas is used in every industry and in almost every home throughout the kingdom. A rising demand for gas is a sure sign of better trade and a higher standard of living.

We have been told of an American lady whose gas meter acts as a loudspeaker for her radio. If gas meters could speak as well as they add, they would tell the social history of the year. They would say that the eight million gas cookers of Britain have been cooking more food than ever before; that hot baths are replacing cold tubs; that the gas refrigerator is becoming as popular among British families as it has long been in America and that the Spartan habit of dressing and undressing in cold bedrooms is giving way before the invasion of switch-on gas fires.

An encouraging feature disclosed by the figures for 1936 was a marked increase in the use of gas for industrial processes. It is significant that this increase was general throughout the country. In the South the improvement in the industrial demand for gas has been due largely to the establishment of new factories planned for working on high-grade fuel. In the past year, however, some of the most notable increases have taken place in the industrial North—a welcome sign of returning prosperity.

All over Lancashire, for instance, the proportion of gas sold for industrial purposes has shown a steady rise, particularly in the areas where glass working and engineering are staple trades. In several Lancashire towns the industrial users of gas account for a third or more of the total gas output. This is true also of Newcastle-on-Tyne, where in the last year the industrial sales of gas have increased by **10%.**

In Sheffield the metal industry absorbs 65% of the gas output. Gas is used there not only for the heavy jobs like gun tubes, boiler drums, and propeller shafts, but also for an immense amount of lighter work in the production of cutlery, knives, files, hacksaws, and so on. In the vast

range of work carried out by Sheffield firms, the only common factor is the need for heat, and the increasing use of gas is due largely to the modern demand for greater accuracy and ease of control.

In the development of the newer industries, centred for the most part in the Midlands and the South, the Gas Industry has played a considerable part. Motor-car manufacturers, for instance, use gas for a great range of processes. The number of new cars being sold per month in the home market is now double the level of 1932, and one result has been a steady rise in the demand for gas.

In the Potteries the industrial consumption of gas has been multiplied in the past few years. This progress is particularly encouraging in a district where the staple industry is of long standing, and where it might be expected that traditional methods of working would be so strongly rooted as to hinder the adoption of modern high-grade fuel in place of raw coal.

The increasing use of gas for industry in busy districts like the Potteries is important to the community at large because it means a real contribution to the abatement of the smoke nuisance. In the days when "muck and money" were supposed to be inseparable, we put up with polluted air in our industrial towns. Nowadays, however, it seems that smoke abatement has at last become a matter of practical politics. For one thing, we have learned from the new industries that have sprung up that a factory need not poison the air of the neighbourhood. All of us know of factories which are entirely smokeless. Again, intensive propaganda for physical fitness has taught us that clean air is quite as important to health as clean water, though it is by no means as common.

In this connection it appears to me to be appropriate that this Joint Conference should be held each year in Birmingham, for in no other city in the United Kingdom is gas applied to so many varied uses as here in the city of 1,200 trades; and it will be remembered that it was the Birmingham Gas Department that 25 years ago established an Industrial Heating Section which, with its Research Laboratories, has since become an encouragement and a guide to many Gas Undertakings not only in the United Kingdom but in numerous other countries.

The spectacular development of industrial gas sales has been fostered by co-operative action on a national scale. The Industrial Gas Development Centres established in a dozen towns in all parts of the country have made it possible for every manufacturer to have expert advice on his own heating problems and on the choice and design of plant. The work of the local centres is closely co-ordinated and there is a free interchange of practical and technical information, so that a vast body of experience is being built up for the benefit of the industry at large. This would have been impossible without national co-operation, and the success of this scheme has suggested possibilities of extending co-operative services on a regional basis.

The use of gas on a huge scale is not confined to workshops and factories. The increasing scope of the public works undertaken by local authorities is an important factor in the growth of gas sales. A topical instance of this is the number of new swimming baths and open-air pools to be opened in recent years; in very many cases the water in these baths is heated by gas. The Gas Industry has helped to make swimming an all-the-year-round pastime for thousands of people who would shrink from the ice-breaking exploits of the Serpentine Spartans.

In the large-scale modern kitchen gas has become practically indispensable. Only this month the largest kitchen in the country was officially opened. It has been provided by the Liverpool Education Committee in connection with the provision of meals for necessitous schoolchildren, and is capable of supplying 10,000 meals in an hour. Meals are to be despatched from the kitchen to twenty-five dining centres, and it is the modern gas equipment that will enable the cooks to deal with the huge "rush hour" demand. The equipment includes twelve boiling pans with a total capacity of 960 gallons and fifteen ovens.

Domestic consumers account for three-quarters of the total gas sales. Generally speaking, a "domestic consumer" is just a technical term for a woman. The secret of successful selling is to study women. Women are responsible for 70% of all the buying that is done, and they influence the other 30%. The average woman spends nearly one-sixth of her life in shopping. She is a professional shopper, whereas most men are comparative amateurs. The salesman to-day has to put women under the microscope—to study their buying technique, their likes and dislikes, their moods and fancies. A salesman who was a misogynist would starve.

Among the exhibits of the Gas Section there are many examples of a changed outlook on domestic equipment. Take the gas cooker, for instance; there is a gas cooker in four out of every five English kitchens. The gas cooker of to-day bears little outward resemblance to its forerunner of a few years ago. It has changed its dress. It is finished in coloured enamel—easy to look at and easy to clean. It is insulated to save useful heat. It has automatic control. And it uses as much as 30% less gas than older types of cooker. This means that when a customer replaces an old cooker with a new one, the gas company sells her less gas for cooking. But it gains her goodwill. In many cases she becomes a customer for other things—water-heating, refrigeration, fires.

Automatic control and increased efficiency are features of most new gas appliances. Gas fires, for example, are now switched on, and they use less gas than older models. The gas fire in conjunction with a flue forms a sound ventilating system. In the recent outbreak of influenza, great stress was laid by medical authorities on the necessity for adequate ventilation. A newly-published report by an advisory committee of the Royal College of Physicians maintains that living-rooms and bedrooms should be provided with flues in the interests of healthy ventilation. This is a point of some importance at a time of activity in the building industry when the omission of flues from new houses with the object of saving costs might have unfortunate results.

In the sale of new appliances there is a magnificent opportunity for extending the practice of co-operative selling. Close co-operation on technical matters, on industrial utilization, and on educative publicity is already an established feature of the British Gas Industry. Recent developments point the way to a co-ordination of sales policy on a bigger scale than has yet been practicable. Regional schemes for the marketing of refrigerators and gas fires have already met with signal success. An integral part of these schemes has been the use of newspaper advertising. The structure of the British newspaper press lends itself to the purposes of large-scale marketing schemes. There is no other country whose markets are so completely covered by national and provincial newspapers. The common interests of British gas undertakings far outweigh divergencies of policy due to local conditions. Plans for the development of co-operative marketing are already being discussed in the various districts. It is proper to mention them at this meeting, because the British Gas Federation represents all sides of the Industry—the appliance manufacturers and supply undertakings whose individual enthusiastic support is necessary for the success of a co-operative policy.

Sustained building activity has played a great part in the revival of general prosperity and has had a direct effect on the sales of gas appliances. During 1936 eight times as much was spent on building as on armaments. More than two-thirds of recent building programmes have been devoted to domestic requirements. Even if, in the near future, there is some regional decline in speculative building, this should be offset to a great extent by an improvement in commercial and industrial building and by the effect of the Government's campaign for slum clearance.

The surveys on which this campaign was based show that 340,000 houses were overcrowded according to the very moderate standard set up by the Government. It is plain that we have a long way to go before we can regard the housing problem as even approximately solved.

In over 90% of the housing schemes already completed gas has been installed, usually for cooking and in many cases for heating, hot water supplies, and lighting. The standard of equipment installed in housing estates for these purposes is governed largely by the question of cost. It is not enough to install modern appliances; the tenants must be able to afford the full use of these appliances. At a conference held at the Housing Centre last year, it was suggested on behalf of the Gas Industry that there should be an unbiased, thorough, and well-informed attempt to review the whole subject of the costs of lighting, heating, cooking, and hot water supply in low cost housing, so as to reach conclusions that will deserve and receive a measure of general acceptance. The Gas Industry feels that such research is necessary if the question of a national housing policy is to be approached seriously and professionally.

In these days there are many signs that ordinary citizens are taking a growing interest in the conduct and activities of the great public services in relation to the community as a whole. This is a healthy development, and it is a positive obligation on public utility bodies to take every opportunity of explaining their work and policy to the man in the street and the woman in the home who are ultimately their employers.

Mr. Therm, in his newspaper appearances, is concerned not only with advertising the services of the Gas Industry, but also with expressing the Gas Industry's attitude towards its public. He demolishes the old-fashioned conception that a public utility must suffer from red tape

traditions. His method of approach is cheerful, brisk, and alert, because that is the spirit in which the Gas Industry tackles its job to-day.

In other ways the Gas Industry shows its attitude towards modern problems which face it in its daily work. Last year, for instance, it produced a film dealing in the manner of the screen reporter with the country's housing problem. At the Fair this year we are to see, among other Gas Industry productions, the now famous Nutrition Film which, with the collaboration of scientists, statesmen, and social workers, analyses another national problem of no less importance. The Nutrition Film contains not a single word of gas propaganda. It is an honest, original and brilliantly successful attempt to expose the underlying factors in a social question with which the Gas Industry is only indirectly connected, but towards the elucidation and solution of which the Gas Industry, as one of the greatest public utilities, feels bound to make its contribution.

A survey of the past year gives ground for confidence in the future. It shows clearly how the members of the British Gas Industry are being drawn together by the consciousness of a common responsibility towards the public. The day of individualism and parochialism is gone. The measure of our progress in the future depends on the increase of co-operation between all the sections of the Industry represented at this Conference.

Councillor JACKSON (Manchester) proposed a cordial vote of thanks to Lord Dudley for his Address. It was a great pleasure to visit that Fair. They always felt they were learning something really useful when they came to Birmingham.

Sir RUSSELL BENCRAFT, in seconding, said it was a great honour to have such a noted industrialist as the Earl of Dudley at the head of affairs.

The proposition was heartily carried and acknowledged by the President.

ENTERTAINED AT LUNCHEON.

Subsequently the delegates were entertained at luncheon in the Bradford Room under the presidency of the Earl of Dudley.

Mr. CHARLES DUKES proposed the toast of "The Gas Industry." He said he felt this was a moment when something might be said covering rather different ground to that covered by the Chairman in his able Presidential Address. Mr. Dukes naturally approached the matter from a rather different angle and he hoped he would not be misunderstood if he dealt with the human factor. Relationships between employers and workmen in the Gas Industry were such that they might well be emulated in other industries for the lasting benefit of industry in general. It was not too much to claim that the Gas Industry was a pioneer industry in the world of collective agreements, and if it existed more generally throughout industry it was probable the balance between one industry and another might be more equitable than was the case to-day. Good as the relationships had been in the past, they were as cordial to-day as they had ever been. The Industry was able to settle its own difficulties in its own way through the machinery of the Joint Industrial Council and other bodies to which they might relegate such problems as arose in the Industry.

He would like housewives to realize the extent to which goods peculiar to the Gas Industry were now available for utilization in the home. Those who had seen that exhibition must admit that whatever might have been the urge or stimulus there was no doubt that in the last ten years the Gas Industry had made up any leeway that might have existed between it and other competitive industries in the way its technicians had placed at the disposal of the community the wonderful articles which they saw in the Fair that day. This was really a propagandist age, and publicity played an enormous part in creating that psychology among purchasers which other people had not been slow to exploit. They had all been interested to hear of the progress of the Industry, and to him one of the most important developments was the type of man they were producing. Every man now regarded himself as a vital factor and as having a prominent interest in the Industry. That was all to the good and he believed it was the only way they could live in this highly competitive world. It was in that spirit of higher co-operation and better understanding and in the belief that everyone, however humble his status, had something of value to contribute that he had the greatest possible pleasure in proposing the Toast.

Sir DAVID MILNE-WATSON, in responding, said they were delighted with the way Mr. Dukes had proposed the Toast and he knew perfectly well that he and his colleagues on the Joint Industrial Council were as actively and as much interested in the welfare of the Industry as anyone in the room. It was not often realized that the Gas Industry was one of the oldest in the country. They were to celebrate the 125th birthday of the Industry. That might not seem much, but they had to realize it was founded in 1812 before railways were dreamed of and when steamships had only just begun to plough through the seas. A thing of which they could be proud was the fact that they were an ancient Industry, they had gone through all these years of competition but they were still one of the leading industries of the country. As an industry they stood seventh in the number of people employed.

He believed that the real note of the success of the Gas Industry was adaptability. From small beginnings in regard to lighting the Industry had become the great purveyor of heat. In all directions they found the adaptability of the Gas Industry, and no truer word had been spoken by Mr. Dukes than in his reference to a united band of workers. From the lowest ranks to the highest there was nothing but loyalty to the Industry. That was one of the reasons why the Industry had prospered so greatly in the past and would prosper so greatly in the future.

The EARL OF DUDLEY proposed the toast of the guests, which was responded to by Sir REGINALD CLARRY, M.P.

The health of the Chairman was drunk on the proposition of Mr. WALTER MUTER (Edinburgh).

DISPLAY OF GAS FILMS.

A display of gas publicity films was given to members of the Conference on Wednesday. Mr. Stephen Lacey (President of The Institution of Gas Engineers) presided, and the screening of the films was interspersed with a light entertainment by Mr. Leonard Henry, who acted as compère.

Mr. Lacey urged that the Gas Industry should do everything possible to create a favourable impression on behalf of gas. The films they were to see did that in the best way possible.

ENTERTAINED BY BIRMINGHAM CHAMBER OF COMMERCE.

Members of the Conference were entertained at luncheon under the presidency of Mr. Percy Plant (Chairman of the Fair Management Committee), at the invitation of the Birmingham Chamber of Commerce.

Proposing the Toast of the "Gas Industry" the Chairman complimented the exhibitors of that group upon an excellent display that was larger than ever. The work of the Gas Industry continued to show manufacturers in a practical way the advantages of gas for industrial purposes, and the Industry was to be particularly complimented on the success of the research centres that had been established up and down the country. The Gas Section was one of the most interesting in the Fair, and it should appeal to every exhibitor in the building. A fresh chapter was being opened in regard to the great manufacturing system of England, and industrialists were fully prepared to take advantage of the new trade era. That fact was well demonstrated at the Fair. He believed trade development would be steady and progressive, which would be all to the good. Stability was what they wanted and not spectacular trade booms. Workshop practice had been very largely improved and industries had been brought to a high state of efficiency and were now able to meet the most exacting requirements. Every British industry used gas for one or more purposes and everything pointed to a largely increased use of gas for heating and for other purposes in the future.

Mr. STEPHEN LACEY, in responding, said he thought it could be claimed that the British Industries Fair had played a very important part in the trade revival of the last few years. They would all appreciate the fact that the Gas Industry had benefited by the work of the B.I.F. Improvement in trade was reflected in the increased purchasing power of the people, and there was no question that the great reconstruction work they had been able to effect in the last few years—that was, in replacing old-fashioned gas appliances by up-to-date appliances—had made that possible. In his own Company in London, in the course of two years they had installed as many as 400,000 enamelled cookers. That was to say, they had supplied one enamelled cooker to one out of three of their customers in the course of two years.

In the development of heat process work, which called for an exceptional combination of technical and commercial ability, the Birmingham Gas Department had played a leading part. The Undertaking, under the leadership of Mr. A. W. Smith, was generally recognized as one of the foremost in the country. He would like to take that opportunity of telling Mr. Smith—the value of whose services to the Gas Industry it would be difficult to exaggerate—how glad they all were that he had been elected Chairman of the British Commercial Gas Association following the retirement of Sir Francis Goodenough.

He was sure they would all realize the important part that those Conferences arranged by the British Gas Federation played in bringing together all those who by their concerted action could so immeasurably affect the quality of the gas service rendered to the public.

The health of the Chairman was drunk on the proposition of Mr. A. W. SMITH.

Gas-Works Reconstruction

WITH A VIEW TO

Effecting Economies

by
J. HOLLAND,
of Stockport

From a Paper read before members of the Manchester and District Junior Gas Association at a meeting held in Manchester on Feb. 3—the PRESIDENT (Mr. T. Caldwell, of Widnes), in the chair.

The Stockport Undertaking has shared in the general increased consumption and shortly after the war it was apparent that extensions to the works were a necessity to cope with the growing demand for gas.

The carbonizing plant consisted of inclined retorts, and in 1921 two benches, each of 12 vertical retorts, were erected, capable of producing approximately 2½ million cu.ft. of gas, followed in 1925 by two further similar benches. After these had been put to work, the inclined retorts were closed down.

This arrangement of four separate benches of carbonizing plant enabled us to meet the maximum load comfortably, allowing for the increased consumption estimated for several years to come, and had the flexibility required for varying demands. During the summer months one or two of the benches were shut down in rotation and repairs carried out.

The whole of the space available on the works for carbonizing plant had been occupied by the inclined retorts which could produce 3½ million cu.ft. per day. The present carbonizing plant of vertical retorts occupies less than half the space and is capable of producing 5 million cu.ft. per day.

The coal breaker, coal and coke handling plant, and all intermittent working machinery, where a short interruption in running is not of vital importance, are driven by electric motors, the current being obtained from the adjoining works of the Corporation Electricity Department. With this arrangement, all the steam produced from the waste heat boilers is available for the drives of the ancillary plant which operate continuously, and mainly consist of non-condensing engines.

In 1925 we had carbonizing plant to produce 5 million cu.ft. per day normal working, and ancillary plant nominally of only 3 million cu.ft. capacity. The average day's delivery was about 4 million cu.ft., so that a general reconstruction of the ancillary plant was imperative.

Divided Gas Flow.

The scheme decided upon consisted of enlarging the plant by adding a further stream of ancillary plant of similar capacity to the existing, thus forming two streams which eventually would divide the gas flow from the retort house, and after metering, be merged again before passing into storage. The arrangement made for simplicity in erection, could be carried out when opportunity occurred without interfering with manufacture, and when finally completed would enable us to keep a check on the production from the units of the carbonizing plant so that any deficiency could be traced to the particular setting. This duplication of all units also gave us the opportunity of closing down any part of the plant which required examination or attention.

Each washing stream now consists of a Livesey Washer, P. & A. tar extractor, vertical centrifugal washer, and a Holmes horizontal rotary washer, all capable of dealing with 3 to 3½ million cu.ft. per day.

On completion of the washing plant, during the summer of 1927, a new exhauster came into our programme. We had two exhausters, one of 200,000 cu.ft. per hour capacity (4,800,000 per day) and one of 120,000 cu.ft. per hour (2,880,000 per day), the latter being able to deal only with the lightest summer load, leaving the former to be our only means of dealing with the winter period. A stand-by machine of similar capacity to the larger was imperative for safety. The only criticism of the old machines that could be made, apart from the capacity of the smaller, was that they were both of the two-blade rotary type, and caused fairly heavy oscillations at the retorts. This was detrimental to good working, and to improve this feature a turbo type of machine was installed in the summer of 1928 and was put to work during the following winter.

The purifiers were the next part of the plant to be extended, the existing purifiers being four elevated boxes with water seal valves, the revivification of the oxide being carried out at ground level beneath. These boxes were built in 1899, and had a nominal capacity of 3 million cu.ft. per day. A contract was let in 1928 for a similar set of four boxes to be erected adjacent to the existing and having a separate inlet main from the washing plant.

Mechanical plant for oxide handling for both new and old boxes was included in the contract and consists of two elevators with band conveyors running overhead for the full length of the boxes so that by means of a travelling tipper the oxide can now be fed direct into the boxes through canvas chutes.

A "Hi-lift" mechanical shovel gathers up the oxide at ground level and feeds the oxide into either elevator. This mechanical handling plant has proved very efficient, and whereas we previously required about 12 men to transport the oxide in a reasonable time, we now require only four men and the work is completed considerably quicker.

The work of emptying the boxes has also been speeded up by the use of pneumatic spades which enable the men to break the hard oxide without becoming unduly fatigued.

During the erection of the purifiers a Connersville type station meter was installed in the engine house with an overhead gas main from the boxes. The main contained a by-pass and valve into the underground outlet main from the old purifiers and the connections at the new meter were also arranged for a future second meter.

We had by this time placed the gas-producing plant in order for the immediate demands made upon it, and our efforts were then directed into the question of gas storage. The gasholders at this time were two four-lift holders each having the capacity of about 1¾ million cu.ft., and had been converted from two-lift column-guided type by means of rope-guided flying-lifts. The steelwork of one of the holders in particular was in a very bad condition, the maintenance costs becoming larger every year, and the gas leakages caused us considerable losses, so that we had either to renew the sheeting or erect a third holder. The latter course was decided upon as the former would have left us with only 1¾ million cu.ft. storage during the renewal, and this in a holder which was not in very good condition. The only site available for the holder was close to the two existing holders which had underground brick tanks, and after full consideration a contract for a waterless holder was let in 1930 and erection commenced. One of the chief points in adopting this kind of holder was the comparatively small foundation required and the light loading on the ground, which on a site consisting of made-up ground was a great consideration to avoid any damage to, and possible leakages from, the existing holder tanks. Inlet and outlet connections to the gas mains had been provided for previously, and in the new work connections were included for a Dri-gas plant which was also being erected in order to obtain full advantage of the waterless holder and to improve the conditions of the services and meters on the district. The waterless holder is of 3 million cu.ft. capacity, and the Holmes Dri-gas plant is capable of dealing with 5 million cu.ft. of gas per day.

Benzole Recovery.

Benzole plant was erected in 1934 and is capable of producing 2 to 2½ gallons of crude benzole per ton of coal carbonized from 5 million cu.ft. of gas. To meter the volume of the dehydrated and debenzolized gas passing into storage a Holmes Connersville meter was fixed on the outlet of the Dri-gas plant.

It was realized that while the reconstructions were being carried out an ideal opportunity was presented for giving attention to many details which would give collateral economies. These included the widening and improving the layout of the works roadways, with duplicate weigh-bridges, thus giving unimpeded two-way traffic. This is a vast improvement in view of the fact that we have no railway sidings at the works and all our coal and coke is carried by motor vehicles.

Similarly, while excavations were in progress it was an easy matter to install orderly pipe trenches for a scheme of drainage and exhaust steam utilization. Automatic syphons were fitted to the gas mains and connected to a common drainage system leading to the tar well. Syphon pumping has consequently been done away with, and in

order to avoid any possibility of flooding a suitable overflow from this well to the liquor well was added.

In 1933 one bench of vertical retorts was shut down for re-setting, and while the work was in progress we remodelled the retort steaming arrangements. The fan of the waste heat boiler connected with this bench was driven by a steam turbine exhausting into the atmosphere, and live steam direct from the boiler was used for steaming purposes after passing through a reducing valve. To utilize the exhaust steam from the turbine for the retorts, a new turbine was installed capable of working against a back pressure of 25 lb. per sq.in., and the exhaust steam passed into a ring main around two of the benches from which it was fed to the retorts and to the producer grates. A connection with a " make-up " valve was joined to the steam main, so that should the pressure in the ring main fall below the required figure, due to a deficiency of steam, it would be augmented by live steam. This connection is also necessary during the periods that the boiler is closed down for inspection, cleaning, or repairs.

The economy is quite apparent, the saving of live steam amounting to the quantity required for driving the turbine, and the arrangement proved entirely satisfactory, so that the remaining retort benches were similarly fitted and the turbine of the boiler connected with these benches also replaced by a back pressure type.

This success created a desire for further economies. A census was taken of all the steam-using appliances, from which it was noted that a large amount of low-pressure steam was being used in the works and with slight modifications this could be substituted by exhaust steam. To give an example, the liquor concentrating plant was one in which about 1,400 lb. of live steam were used per hour, obtained from the steam mains at 130 lb. per sq.in. pressure and reduced to 5 lb. per sq.in. at the still. A bore hole water pump using a similar amount of steam is in close proximity to the plant and it was therefore a fairly simple matter to connect the exhaust from the pumps to the still. A little more live steam is required by the pump working against the small back pressure but this is easily offset by the saving in live steam previously passed into the still, the saving amounting to 4s. for every ton of concentrated liquor made. Similarly it is our intention in the near future to use exhaust steam at the benzole plant.

The net result of this and other modifications has been that we now find it unnecessary to have the Lancashire boilers in operation, except for short periods when there is a heavy steam demand, or when a waste heat boiler is down for cleaning and inspection.

Discussion.

The PRESIDENT (Mr. T. Caldwell) said that many engineers would have to face problems similar to those experienced at Stockport, and the Paper would be a great assistance in finding a solution to them. He was rather surprised to note that there were no railway sidings at Stockport. He thought that if the plant had been put down adjacent to a railway siding, considerable economies might have been effected. He would have liked the economies effected by the reconstruction to be shown in £ s. d.; as it was often found that many sound technical ideas were too prohibitive in cost to warrant their adoption. He wished, however, to congratulate Mr. Holland on his Paper.

Mr. W. HODKINSON (Manchester) said he considered the splitting of a make of 3½ million per diem into two streams was rather an expensive item. It would mean the cost of running two exhausters. He agreed with Mr. Holland that great economies could be effected by utilizing exhaust steam, and such a course had been adopted at Stretford in connection with a liquor concentration plant. Stockport was fortunate in being able to clean up the mains system and increase the size of the mains in certain cases, for back pressure on exhausters could be very costly.

Mr. J. ALBINSON (Manchester) asked if Mr. Holland had found any difficulty in balancing the quantity of gas through each stream. If one unit was producing to full capacity, and the other to ¼ capacity, how was the gas flow adjusted so that each took one-half of the total?

Mr. HOLLAND, in reply, said that this was done by adjusting the valves at any particular point.

Mr. H. PLATT (Bolton) stated that the reconstruction at Stockport was similar to the practice at Bolton. One advantage of having two exhausters of 3 millions each instead of one of six millions was that during the summer when the make was reduced to one-half, only one exhauster would be required, thus a saving in running costs was effected. There was a good deal of discussion as to which was the best method of distributing steam. Until some more conclusive evidence was forthcoming he preferred the high-pressure steam line, reducing down to low pressure at the required points.

In reply to a question from Mr. HAINSWORTH (Wallasey), Mr. HOLLAND stated that there had been no trace of oil trouble in the boilers.

Mr. PLATT (Bolton) proposed a vote of thanks to Mr. Holland for his Paper, which was seconded by Mr. H. C. APPLEBEE (Manchester).

Effects of Changes in Composition UPON THE Combustion of Town Gas

We publish below a report of the discussion which followed Mr. F. O. Hawes' Paper (see last week's "JOURNAL") presented before the London and Southern District Junior Gas Association at a meeting held at the London School of Hygiene and Tropical Medicine on Friday, Feb. 12.

Mr. C. A. MASTERMAN (Gas Light and Coke) remarked that Mr. Hawes had given a very clear exposition on a difficult subject which was of very real practical importance, especially at the moment when varying coke demand almost inevitably led to variations in gas quality which, if not controlled, were bound to lead to trouble on the district. These troubles were not confined to lighting back but might include over-gassing with prejudice to combustion, under-gassing with prejudice to heat output, flame contact with prejudice to combusion or to the fabric of the appliance, and even in some cases to blowing out of the flame. During the last few years, many demands had been made on those responsible for the manufacturing side in the Gas Industry. The calorific value was standardized; the slogan was launched—" Sulphur Must Go;" they were demanding eradication of gum; they were asking for standardized pressure and now required more nearly standardized specific gravity and flame velocity. At the moment they had not a method of expressing numerically the combined effect of these latter characteristics, so that the first step would appear to be agreement on a yardstick. Thereafter the problem was double-sided—on the one hand asking the engineers to maintain as small a range of specific gravity as possible, while on the other hand so influencing the makers of gas appliances as to ensure the provision of burners having the maximum latitude possible in this respect.

If they were concerned solely with fulfilling a demand from the public for gas by volume this question of quality would not arise. If they were concerned solely with providing the public with a quantity of crude heat in therms of gas this question of quality would not arise. The public demanded from the Gas Industry not volume of gas nor crude heat but heat service, whether it was in the form of hot water, cooking, space heating, or factory process. If changes in gas quality caused their service to break down or to be indifferent, then they were failing to provide what the public was required to pay for. This problem might be thought to be academic, but was, in fact, of real immediate importance. As the Author said, work had been in hand for some time at Watson House and was being undertaken at Leeds in conjunction with The Institution of Gas Engineers. Their work at Watson House—like that of Mr. Hawes'—was largely influenced by the day-to-day problems arising out of this gas quality change, but he hoped that at Leeds, as on the Continent, more systematic work of wider scope would be possible, so that in due time all the requirements of the public could be economically fulfilled.

Mr. P. C. GARDINER (Tottenham) congratulated Mr. Hawes on bringing forward this subject of gauging the usefulness of gas by means of its Ott number. This method was used by Dr. Ott in Switzerland some ten years ago, and it deserved much more attention than it had yet received in England. The angle from which Mr. Hawes had approached the subject, too, was to be commended inasmuch as he started from first principles and followed through the manufacturing stage to the burner. In Germany attempts had been made to standardize the gas distributed in some towns by the introduction of restrictions upon the Ott number as well as the calorific value. Mr. Gardiner did not want to see more restrictions imposed upon the Gas Industry in England, but he thought Mr. Hawes had shown that it behoved them all to take notice of the subject and so obviate the question of restriction being raised. This applied particularly in the case of amalgamations where supply areas were contiguous. If an area could be supplied from two works the figures given in the Paper showed that there might be sufficient difference in the constitution of the gases to cause

trouble with burners although the calorific value might be practically identical. This might well be the cause of mysterious troubles in the past.

Mr. HAWES, in reply, agreed that where amalgamations had taken place and it was proposed that the mains of the two undertakings should be linked up the question of maintaining constant composition was one of the factors which should receive careful consideration by those concerned.

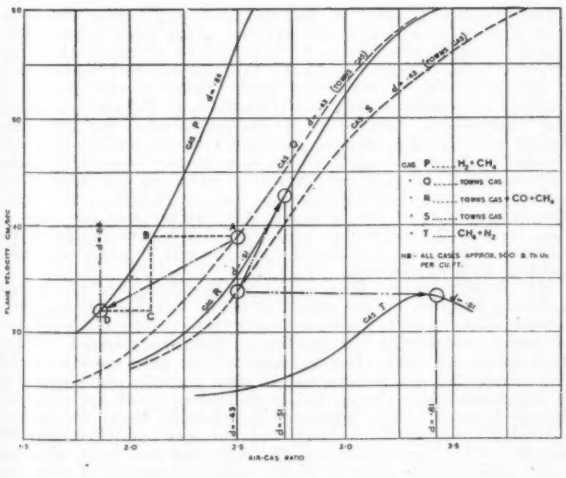
Mr. L. T. MINCHIN (Gas Light and Coke) said he had been particularly interested in hearing Mr. Hawes' Paper, as he had been doing work of a similar kind at Watson House during the past year or two. He thought it would be generally agreed that Mr. Hawes had given a very lucid account of a problem which had hitherto received far too little attention in this country. The greatly increased variety in methods of gas manufacture to-day was certain to make this a more important problem in the future.

Conditions for Back-Firing.

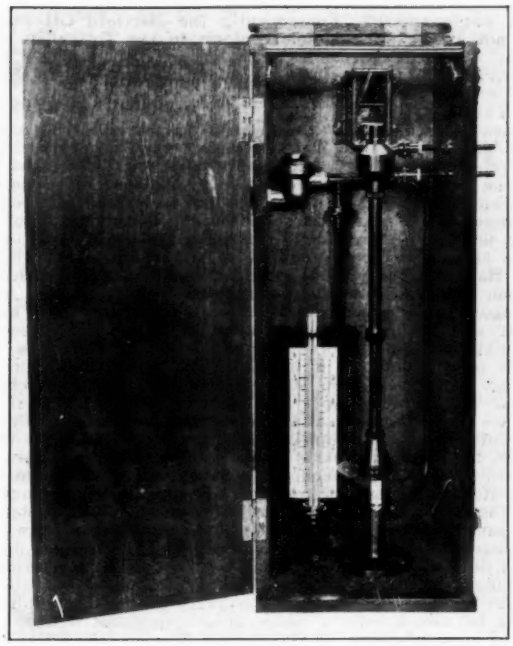
There seemed to be an inherent error in the assumption that a burner lighted back only when the flame velocity was greater than the mixture velocity in the burner tube. In practice, observation showed that the cone of a bunsen flame could not usually be reduced to a height much less than its base diameter. The minimum height of cone was less when the burner was carefully made and free from eddies, but was probably never less than 0·6 of the diameter. Consequently, since the area of a cone of height equal to its diameter was approximately twice the area of the base, it followed that the flame velocity did not need to be much more than half the mixture velocity to cause flash back.

The accompanying graph showed some curves which he had obtained over a wider range than the curves given by the Author, and it would be seen that they rose to a maximum in the neighbourhood of 3·5 air/gas ratio. This diagram also showed quite well the importance of the flame velocity curve in affecting the cone height of a flame on an actual appliance. Thus it would be seen that a change from gas S to gas R caused a big rise in flame velocity and might consequently cause a light-back, whereas a change from S to T or from Q to P, might well result in very slight change in the appearance of the flame in spite of the big difference in specific gravity.

One of the directions in which a very little was yet known was the relation of gas composition to its test burner number. The problem was made very complicated by the presence of seven components in the gas and the additional effect of specific gravity and calorific value as separate factors which were themselves dependent upon the composition. Mr. Minchin was inclined to class the olefines as short flame gases and to attribute the short flame character of carburetted water gas to the high olefine content. Furthermore, the ratio $\frac{CH_4 + C_nH_m}{H_2 + CO}$ as a criterion seemed very questionable in view of the fact that the progressive replacement of hydrogen by CO in a 500 C.V. mixture with methane certainly caused the gas to become more short flame in character.



One thing upon which they could all agree with Mr. Hawes was the grave need for a common scale or yardstick on which test burner results could be compared. The Ott burner did not fulfil this purpose, since it was freely admitted that different specimens of the German Ott burner might give considerably different readings of the same gas. The only definite scale in Germany was that offered by the Czako Schaack prüfbrenner—an instrument, however, which was rather unnecessarily complicated and whose price was likely to make it of very limited application in this country. The Gas Light and Coke Company had accordingly arranged with Messrs. Alexander Wright & Co. for an aeration test burner (as shown in the accompanying illustration) to be put on the market. In this case, as in the prüfbrenner, the adjustment was made by setting the inner cone to a given height rather than by the lighting-back point. This, in conjunction with one or two other refinements, made the aeration test burner a much more satisfactory instrument



than the Ott burner, and the scale of this instrument might well develop into a recognized national or international scale.

Mr. HAWES replied that for simplicity he had indicated that lighting back occurred when the mean velocity up the tube equalled the flame velocity, but, of course, the velocity in the tube was not uniform across the bore and, hence, lighting back probably took place down the slower streams of air-gas mixture near the side of the tube. This would account for Mr. Minchin's figure of half the mixture speed.

He thanked Mr. Minchin for showing his interesting graph with its greater range and pointed out the respects in which it was corroborative of his more limited practical range curves. Mr. Hawes agreed that olefines had a fairly high maximum rate of flame propagation, but pointed out that their air requirement to initiate combustion was almost as high as that of methane. Since, in his opinion, it was, at any rate, in low pressure appliances, the earlier stages of the flame curves which were effective, he was still inclined to include olefines in the numerator of his ratio. That ratio has a straight line relationship to the Ott number in the examples given in the Paper. Most of these were practical examples, being gases actually sold from one or other of the manufacturing stations of the Tottenham Undertaking. In any case he had only claimed a rough proportionality. The variations in the German Ott burners, said Mr. Hawes, were overcome at Tottenham by calibration against a standard and complete agreement was easily maintained.

Mr. Hawes emphasized that his specific problem was lighting back, and he thought it was unquestionable that his burner was the correct test for this purpose. Whether a single reading, even of the cone height, would be sufficient to give information as to both lighting back and cone length was open to question. Incidentally, for use in unskilled hands he had found the Tottenham burner preferable to a cone height meaurement.

Regular Daily Tests.

Mr. C. A. DEAS (Hertford) remarked that at Hertford the question of change in composition of the gas had been considered of such importance as to justify regular daily tests of the Ott value of the gas sent out. These tests had been carried out regularly for the past three years and had been of very great assistance in preventing trouble on the district with lighting back and blown mantles. From his experience, particularly when carburetted water gas was in use, it was of no advantage to maintain constant calorific value and specific gravity unless the composition was also under control. In fact, straight-line composition was to be preferred, within reasonable limits, of course, to straight-line calorific value and specific gravity. As Mr. Hawes had said in his Paper, this sounded rather like a condemnation of carburetted water gas, whereas it could actually be a great assistance in enabling one to take advantage of the flexibility of carburetted water gas plant without undesirable repercussions on the district. By the use of the Ott burner at Hertford and by admitting both producer gas and carburetted water gas to the coal gas stream it had been found possible readily to vary the carburetted water gas content from 0 to 30% without great difficulty, though for simplicity of control the producer gas/coal gas mixture had been found to be the better. Mr. Deas was sure they all appreciated the benefits which would result from the use of fixed gas and air orifices, and Mr. Hawes had shown them in his Paper how they could measure their gas in order that this ideal could be attained.

Mr. HAWES remarked that the Hertford Undertaking was outside the Tottenham Company's "inner" area, and the mains

were not connected. Consequently the Hertford Ott number did not at the present time conform to the Tottenham standard. Mr. Deas' burner had a rather more open scale.

Mr. A. B. DENSHAM (Gas Light and Coke), referring to the $\frac{CO + H_2}{CH_4 + C_nH_m}$ ratio, said that there were, of course, two methods of measuring flame velocities which did not give the same results. Mr. Hawes had shown results obtained by Wheeler by the tube method. It was probably better in the present connection to take the figures obtained by the cone shape method, by which Smith and Pickering* obtained very different results; hydrogen had a maximum of 250 and carbon monoxide of just over 40 cms. per second. Thus carbon monoxide was in the same class as methane, not hydrogen, which rather affected Mr. Hawes' argument. It was more likely that the effect of carbon monoxide was due to its high specific gravity, which increased the aeration and so moved the mixture to a higher point on the flame velocity/aeration curve. Mr. Densham thought that the Author was wrong in saying that there were limits of Ott number in the D.V.G.W. specification for gas, though limits had been suggested in the German Technical Press. Mr. Hawes' Paper had made him realize that it was not always the largest gas undertakings which led the way. In the Cotswolds last autumn he had visited a one-man gas-works where the "popping-back" point was used to measure the calorific value, and although the latter might not have been very steady, the undertaking was ahead of the times in keeping the combustion characteristics constant. Mr. Masterman had said that they must not rely upon the works side to solve all their problems. In this connection Mr. Minchin had done a great deal of work, which he did not have time to describe, in devising methods for obtaining supplies of gas of various test burner numbers by "doping" ordinary gas so that appliances could be tested over a range of gas qualities before being passed as satisfactory.

Mr. HAWES agreed that the figures obtained from the tube method were different from the cone method, but he was not sure whether the carbon monoxide was tested dry or wet. He had only reproduced the curve for moist CO. It was not so much a matter of the maximum possible velocity—they never got anywhere near that region—but rather the amount of air required before flame commenced to propagate at all.

Mr. F. LAKE (Radiation Ltd.) said that it was to be hoped that thought would be given by the gas production side to the possibilities of minimizing these difficulties in regard to the composition characteristics of gas. On the laboratory side there were serious problems to be faced, one of which was to reproduce the conditions of the district. Mr. Minchin had referred to means of making "synthetic" gases of differing test burner numbers and registering these on the scale; but Mr. Lake was not satisfied that these gases were really similar to those found on the district which registered the same test number. That introduced definite difficulties in connection with the operation of appliances. Burners could be operated at wide variations of gas quality, but it was bound to be a sort of compromise. They on the appliance side would do their best to meet the manufacturing side in providing satisfactory service to the consumer.

Mr. HAWES replied that he had every sympathy with the manufacturers of appliances. In his own case they were concerned with dealing with the effects of variations in the gas from two works which were supposed to be supplying equal gases; but the appliance manufacturers had to provide for many different calorific values.

If an appliance lighted back at a given Ott number using a laboratory mixture, he would say that it would light back on a district gas of the same Ott number. He was doubtful, however, if excessive flame length on an appliance with a synthetic gas of given Ott number, would necessarily mean the same behaviour with a district gas of equal Ott number.

Mr. E. W. B. DUNNING (Gas Light and Coke) said that much experimental work remained to be done, but the principal factor affecting the combustion performance appeared to be the aeration of the flame, the lengthening of which increased the flame contact. The importance of this factor depended upon the type of appliance, as described in a Paper given before The Institution of Gas Engineers—"Combustion Standards of Gas Appliances." Another factor was the ease of combustion of the various constituents, and in the same Paper it was shown that with an equal calorific value mixtures of H_2 and N_2 and either CO, C_2H_4 or CH_4 that the methane mixture gave the worst combustion. Overload tests were at present carried out with the normal gas supplied and after adding methane to the gas in sufficient quantities to obtain a test burner number of 90. While the results were promising, it was yet too early to say that this method gave the same results as natural variation of a test burner number with composition. Variations in gas quality which led to lighting back were immediately pointed out by the consumer, and in any case, burners were now being developed which did not light back. Variations which led to poor combustion were less noticeable but equally important.

Mr. HAWES said that his replies to Mr. Minchin and to Mr. Lake covered most of Mr. Dunning's contribution. Owing to the fact that the flame curves were not parallel, a test at one point only of the scale could not possibly give sufficient information to cover the whole scale. He agreed that much remained to be done on what he called the other end of the scale from his own experiments.

* "Measurements of Flame Velocity by Modified Burner Method." Journal of Research of Bureau of Standards, 1936, Vol. 17, p. 7.

Mr. R. F. TWIST (South Metropolitan) observed that for the reasons Mr. Dunning had just given this matter had not been of such concern to the South Metropolitan Company. As all their gas was made in horizontal retorts they were able to fulfil these standards. For the same reason they had been in the fortunate position of being able to supply appliances with fixed gas and air ports, and there was no indication that they would depart from that practice.

Mr. H. J. RISBY (South Metropolitan) said that the effects of changes in composition upon the combustion of town gas was a matter of primary concern to every Gas Engineer, although he must confess that he was rather intrigued to know how this was effected when occasionally he observed complication of various carbonizing systems on a works; the maintenance of a standard gas composition could be no easy task in such instances. At a recent meeting of the Association's Council, Mr. H. H. Creasey—a founder-member—had given a very interesting account of the early days of their Association, and a retrospect of his own career with the Gas Light and Coke Company. Mr. Creasey attributed his success to a motto which he had varied from Napoleon's "Audacity, Audacity, Always Audacity"—to "Maintenance, Maintenance, Always Maintenance"—a most desirable foreword for a progressive policy, but, unfortunately, not always sufficiently emphasized where the commodity itself was concerned. It seemed to Mr. Risby that to give the highest degree of attention to the maintenance of gas appliances on the district and to overlook the commodity was to put the cart before the horse. Mr. Hawes had pointed out that the finest adjustments—he would call them "Vernier" adjustments—of gas appliances were essential for those last few degrees of combustion efficiency for which they were constantly striving; and yet with this Vernier adjustment untold trouble could be anticipated if gas of varying characteristics was supplied. His Company's policy of fixed orifices for appliances was well-known; they had made the Vernier adjustment a permanency and had always maintained a carbonizing policy which—although sometimes criticized by the uninitiated as "somewhat conservative"—was most essential to ensure a supply of gas of a constant composition, which was especially desirable, as Mr. Hawes had remarked, in the case of gas for industrial purposes. All who read Mr. Hawes' Paper would appreciate that gas must be supplied to definitely fine limiting proportions in composition for the maintenance of permanent maximum combustion efficiency, especially when using fixed orifices of Vernier adjustment, and that high adjustment efficiency should characterize all gas appliances. Therefore, in echoing Mr. Creasey's motto let them not forget to begin at the beginning by ensuring the maintenance of a commodity of constant characteristics, and then carry on with the maintenance of the appliances efficiently to combust that commodity.

Mr. HAWES remarked that this was an excellent ideal to be aimed at, but undertakings with millions tied up in various types of carbonizing plant simply could not do it. The manufacturing side could not promise consistency just yet.

Burner Sensitivity.

The PRESIDENT (Mr. R. Summerson) stated that "the excessive troubles which initiated this enquiry were subsequently traced to the faulty design of a new type of lamp which had recently been installed, and that the gas was to blame only in a minor degree," seemed to imply that certain designs of burners were more sensitive to variations in the Ott number of gas than others. Could Mr. Hawes define what factors in the design of a burner affected its sensitivity to variation in Ott number? Another well-known phenomenon was that some burners went out with a loud report when the gas supply was suddenly turned right off from the full on position. Could Mr. Hawes say to what extent a low Ott number was the cause of this, or was the explosion caused by a defective design of the burner? The point was of some importance, as most consumers disliked such explosions.

Mr. HAWES replied that so far as the design of the burner having a bearing on the effect of a low Ott number was concerned, there used to be such appliances; but he did not know of many to-day. In the particular instance referred to they were concerned with cluster lamps which were so constructed that, when the gas was turned on, the air which had remained in the superheater during the period of rest did not pass uniformly to each of the burners. He thought there was always a tendency to pop back when the gas was suddenly shut off; but the faster burning the gas the more one was approximating to an explosion as a result of the sudden stoppage of travel up the tube and the consequent "flip" back of the light.

Mr. S. C. WALDOCK (Gas Light and Coke), the Junior Vice-President, proposed a vote of thanks to Mr. Hawes for his Paper.

Mr. H. H. BROWN (Southampton), in seconding, asked if Mr. Hawes had attempted to correlate the ratios of gas constituents to ascertain the amount of air required for complete combustion. Also had they carried out any tests with upright burners and were these investigations limited to lighting burners only?

The vote of thanks was unanimously accorded, and, in acknowledgment, Mr. HAWES said that they had not yet carried out any investigations with upright burners, and while they had not tackled any other appliances at Tottenham, this matter was at present in the capable hands of Watson House. A calculation of the total air requirements was not what they were concerned with. It would be found that the divergencies in the amount of air required to initiate combustion were very considerable and were the important factors.

Domestic Hot Water Supply by Gas Circulators

by
W. N. SMIRLES, B.Sc., A.I.C.,
of the Birmingham Gas Department.

From a Paper read before members of the Midland Junior Gas Association at a meeting held at Birmingham on Thursday, Feb. 4—the PRESIDENT (Mr. F. A. Jenkins, of Leamington) in the chair.

When we come to consider the provision in bulk of hot water for domestic purposes, two convenient means are available of performing this water heating by gas. A great deal of controversy rages at times as to which of these two methods—viz., the instantaneous heater or a storage system—is the better from the point of view of policy. While keeping as clear as possible of this controversy, we might say that generally no more convenient, and at the moment certainly no cheaper, way of providing hot water by gas is possible than with the instantaneous heater, single or multipoint.

At the same time, conditions do not always permit the installation of instantaneous heaters, or it may be that prejudice on the part of a consumer leads us to apply an alternative system of gas heating. Over a large portion of the year the boilers of domestic solid fuel grates are relied upon for a more or less satisfactory supply of hot water. A means of replacing this service by gas, particularly during the summer months, or of reinforcing it when deficient, should prove a valuable source of revenue. I therefore propose to discuss the gas heated circulator as attached to existing domestic hot water storage systems.

We have for years in my Department carried out tests on the various types of circulator which are put on the market. Tests show thermal efficiencies, under certain conditions, of 60-70%. I do not wish to stress the idea of thermal efficiencies too much, but as I wish to refer to competition later, comparative working costs can best be derived from working efficiencies of appliances. Our knowledge of the actual working efficiencies of this particular class of appliance is very limited, and in view of the competition we have to face, it behoves us to take stock of the position.

Let me first of all outline in brief the various tests that we apply to the heaters.

(1) They are examined for combustion at the makers' rating which may be from 10 to 40 cu.ft. per hour, 10 or 30 cu.ft. per hour being the most usual sizes. This consumption must be obtainable at ordinary mains pressures. Combustion is then also tested at a gas rate corresponding to a pressure increase of 100%—*i.e.*, from 3 in. W.G. to 6 in. W.G. The appliance must withstand this increase without the CO/CO_2 ratio rising above 0·01.

(2) The circulator is connected to a 30-gallon tank (21 in. cube) entirely enclosed but not insulated in a wooden cupboard with 2 in. clearance between wood and tank. Connection is effected by uninsulated flow and return pipes of the recommended size and of minimum length for adequate circulation. A restrictor, if provided, is inserted to restrain the circulation. Depending upon the gas consumption, heating is performed over various time intervals, say, 1 hr. and 2 hr., in the case of a 30 cu.ft. per hour heater, and 3 hr. and 6 hr. in the case of a 10 cu.ft. per hour heater. The thermal efficiency is based on the whole heat obtainable on drawing down to cold. This test, as before stated, usually gives values of the order 60-70%. During the heating test above, the course of heating is followed by the reduction of the gas consumption and the circulation noted by reference to the temperatures of the flow and return pipes.

(3) After standing under thermostatic control overnight, the requirements of the system for temperature maintenance are determined.

(4) A thermal efficiency test may be performed, using the circulator as a small instantaneous heater. This gives the maximum thermal efficiency. Surface temperatures, formation of condensation, &c., are noted as the need arises.

Such methods of test, though useful for comparing appliances, give little indication of their practical working efficiencies. The determination of the latter has been made in the work to be described.

As it is obvious that with a fully automatic installation the efficiency will vary with the water demand (being zero if no water is drawn), it was decided to fix upon a certain water demand—viz., 50 gallons per day—and base our charges upon this. This 50 gallons was drawn in three main lots, 25 gallons in the morning, 5 gallons at lunch time, and 20 gallons at night. Later in the Paper it will be shown how the daily cost, &c., vary with the water demand.

In practice, heat losses from connecting pipes and tank over long intervals of time may be considerable. We adopted as a possible maximum a flow height of 10 ft. and determined the effect of insulating this upon the working efficiency of the system. Later, the storage, too, was insulated and the effect of this determined.

For insulating the system, plumbers' felt (a hair felt bound on by a canvas backing) was used for the pipes and slag wool for the storage.

The circulator used was of sheet metal construction consisting of an annular jacket surrounding a central flue space. The rated capacity for gas of 475 C.V. was 30 cu.ft./hr. Similar tests will be quoted for a 10 cu.ft./hr. heater later on.

Temperatures in the water storage tank were taken by means of a thermocouple sealed in a glass tube and pushed through a rubber sleeve to any required position.

Results of First Series of Tests.

Typical results showing the effect of insulation of pipes and tank upon the performance of the heater are embodied in the following table.

TABLE 1.—*Working Results on Some Gas Operated Circulator Systems.*

Condition	System Unlagged.	Pipes Only Lagged.	Tank and Pipes Lagged.
Gas burnt in 24 hr., cu.ft.	157	161	157
Mean tank temperature when hot, ° F.	109	121	125
Heat recovered in water, B.Th.U.	26,900	31,600	35,100
Thermal efficiency, %	35·7	41 5	46·8

Example of cost of hot water, by typical gas heated circulator with tank and pipes lagged:

Daily cost on basis of 50 galls. raised 50° F. . . = 4·03d.
Cost for one hot bath, 20 ,, ,, 50° F. . . = 1·6d.

To those who may enquire as to the degree of accuracy in these experiments, I would point out that, as may be expected, greater accuracy is obtained when the heat losses are more under control, as with the insulated systems. Thus the figure of 46·8% for the tank and pipes lagged is taken as representative of three successive tests with results 46·8%, 47·3%, 46·8%.

With the unlagged system the results on successive days were 35·3, 37·1, 35·7, 34·0.

Now let me give you the laboratory test figures for this particular heater installed as above and fully lagged.

TABLE 2.—*Short Period Efficiency Tests.*

Duration of Heating Period, Hr.	1	1½	2	2½
Gas burnt, cu ft.	27·1	40·7	51·8	54 5
Temperature of first 20 galls. hot water, ° F.	113	125	135	135
Thermal efficiency, % (test)	68·7	71·2	72·6	68·4

We see from these Tables what a big difference there is between " test efficiency " and working efficiency, and this applies not only to a reasonably insulated installation, but one that would in the ordinary domestic household be regarded as having a fair load.

Very similar results were obtained using circulators of different construction and capacity, thus:

TABLE 3.—*Miscellaneous Working Thermal Efficiency Results.*

Construction.	Sheet Metal.	Cast Gun Metal (Dome with Baffles, &c.).	Cast Gun Metal (Dome with Baffles[1].
Rating, cu.ft./hr. (C.V. = 475)	10	30	30
"Test" efficiency, % . .	68	67	67
Length of flow and return pipes	10 ft.	Minimum 1 ft. + 2 ft. 6 in.	Minimum 1 ft. + 2 ft. 6 in.
Lagging	Tank and pipes as before	None	Tank and pipes as before
Gas burnt in 24 hr., cu.ft. .	109	178	180
Heat recovered in water, B.Th.U.	24,400	33,150	40,100
Thermal efficiency, % . .	47·2	39·1	46·8

The next obvious step in solving the problem of the disparity between the test and actual efficiencies was the determination of the temperature maintenance requirements of the systems in various conditions. These have been determined in terms of gross heat input for various temperature differences between air and water storage. They apply to the circulator of sheet metal construction with a rating of 30 cu.ft./hr.

The data have been plotted in graphs from which we extract representative figures for 70° F. and 80° F.

TABLE 4.—*Temperature Maintenance Requirements of Circulating System.*

Temperature Difference, Water − Air.	Gross Heat Input per Hour for Conditions of Insulation.			
	—	None.	Pipes Lagged.	Tank and Pipes Lagged.
70	B.Th.U.	2,760	1,960	1,100
70	Cu.Ft.	5·8	4·12	2·32
80	B.Th.U.	3.240	2,340	1,340
80	Cu.Ft.	6·82	4·93	2·83

From the aforementioned details we get the saving introduced by insulation as

Pipes . . 1,000 B.Th.U./hr. equivalent to 2·11 cu.ft./hr.
Tank . . 900 ,, ,, ,, 1·90 ,,

I should like to digress for a moment to comment upon apparent differences between actual working efficiency results and values calculated from the test thermal efficiency and the temperature maintenance data. The actual heat losses are greater by reason of the fact that the systems heat up to higher temperatures than their stable maintenance temperatures and then cool off. With the test on the partly insulated system, for example, which I gave in Table 1, we recorded the following:

Time.	Water Drawn.	Temperatures in Cylinder at Distances from Bottom in Inches.					
		3	6	9	12	15	18
9.10	25 galls.	117	117	117	117	117	116
12.10	5 ,,	127	133	137	141	142	142
4.10	20 ,,	125	133	135	135	135	134
9.10	25 ,,	116	117	117	117	117	116

The maintenance requirements as representing stand-by losses are of prime importance. Their possible magnitude is very disquieting, in that even under very favourable conditions the gross heat requirement for temperature maintenance is of the order 2·8 cu.ft./hr. or 67 cu.ft. on a 24-hr. day, at a cost of 2·4d. per day. With a totally unlagged installation this may increase to 164 cu.ft./day at a daily cost of 5·85d. Note that these are for water hotter than was obtained in the tests in Table 1.

These will be minimum charges. In proportion to the water demand, this maintenance consumption will be replaced by the more usefully applied heating consumption, giving with increased demand, increasing thermal efficiency, and diminishing cost per gallon. Thus, with the fully lagged installation, we had the following results:

TABLE 5.—*Cost of Water with Variation in Daily Demand.*

—	Water Drawn—Galls. per Day.		
	25	50	75
Volume of gas burnt, cu.ft. . . .	92	157	191
Thermal efficiency, %	33·6	46·8	54·8
Cost for 20 galls. raised 50° F., pence	2·24	1·6	1·37
Cost per day in pence	3·3	5·6	6 8

A number of factors are responsible for high-temperature maintenance requirements, and I will deal with these in order.

1.—*Heat Losses from the Tank.*

The location of this part of the system is so indefinite that the heat dissipation from it must vary accordingly. As a guide to probable magnitude, we have determined approximately the heat losses from the 30-gallon tank which has been used in the experiments. This was effected by direct measurement of fall in temperature over a suitable interval of time, the heat change being based on the combined water equivalent of tank and contents. The water equivalent of the woodwork but not that of the slag wool packing was disregarded.

With the lagged tank, for the period 3 hr. to 13 hr. the fall in temperature corresponds to 164½° F. to 148° F., so that if the heater were shut off completely for 10 hr., hot water would still be available.

As would be expected, on turning off the gas to such a system, circulation in the parts external to the storage soon ceases, so that insulation of the pipes alone plays no part.

We have for temperature conditions of 140° F. water, 60° F. air.

Condition.	Approximate Heat Loss.
	B.Th.U. per Hour.
Tank enclosed in wooden cupboard . . .	890
Tank enclosed in lagged slag wool . . .	280

A similar determination conducted some years ago on the same apparatus, but lagged with 10 lb. of wool flock, gave a heat loss of 300 B.Th.U. per hour.

It must be borne in mind that the heat loss from the storage is common to all such systems of heating and does not possess much significance from the point of view of competition.

2.—*Heat Losses from Pipes.*

It is common practice, of course, to minimize the length of pipes connecting circulator to storage. It will be advantageous here to give an idea of the magnitude of the losses that may be involved.

For pipes of known surface characteristics and of regular configuration, the heat dissipation per unit time can be calculated with a fair degree of accuracy. All calculations must, of necessity, break down when we get pipes exposed to severe draughts, inserted into walls, &c.

For the purpose of finding the effect of various finishes or insulating materials upon the total heat dissipation of vertical lengths of pipe, a vertical loop of the pipes filled with water can be heated by a very small circulator operating at a known thermal efficiency. Alternatively, a small electric immersion unit could be embodied. Temperatures are taken at specific points.

Unfortunately, time has not permitted the completion of work started in this direction, and which I had intended to carry further to include forms of insulation—*e.g.*, pressed asbestos—more acceptable than the felt used in this work on circulators.

The following are values corresponding to water temperatures of 130° F., air temperatures 60° F., for vertical runs of ¾ in. iron pipe.

TABLE 6.—*Heat Loss from Pipes.*

—	Heat Dissipation. B.Th.U./Sq.Ft./Hr.	Heat Dissipation. B.Th.U./Ft. Run/Hr.
Theoretical (black surface)—		
Convection coefficient = 0 : 32 .	146	41·8
Determined—		
Pipes painted aluminium . . .	105	30·2
Commercial black finish . . .	102	29·2
Lagged plumbers' felt	42*	12·1

* On basis of area of pipes not external area of lagging.

In connection with heat dissipation from pipe surfaces, it is instructive to determine the relative magnitudes of the losses by convection and radiation. This has been done for the appropriate temperature range which comes into consideration in this work, assuming a convection co-efficient of 0·32. Results indicate that for black body conditions (which will be rarely or never met with in practice) the radiation component is the greater, constituting 55% of the heat dissipation. In practice, emissivities of 0·5 would be more common when the radiation will form 38% of the loss.

By polishing the flow and return pipes, facilitated by the introduction of copper, the radiation loss can be reduced to a negligible amount. If chromium plating were possible, this would have the same effect with enhanced appearance.

(To be continued.)

The Bournemouth Gas and Water Company

The One Hundred and Sixteenth Ordinary General Meeting of the Bournemouth Gas and Water Company was held at the London Offices of the Company, 48, Copthall Avenue, E.C. 2, on Friday, Feb. 26—Mr. WILLIAM CASH, J.P., F.C.A. (Chairman of Directors), presiding.

The SECRETARY (Mr. William Cash, Junr., M.A., F.C.A.) read the notice convening the meeting, and the report and accounts for the year ended Dec. 31, 1936, were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the Directors' report and statement of accounts, first expressed regret at the absence through indisposition of Lieut.-Col. H. W. Woodall.

Speaking generally of the accounts, the Chairman said he could sum them up by remarking that there had been an increase in all departments of the Company's business. The capital expenditure on buildings and plant included, so far as the gas undertaking was concerned, the new showroom at Wimborne, which had been completed and occupied—and he could only describe it as an extremely attractive building. It harmonized very well with its surroundings and was doing good work in connection with sales. It was also a centre from which to carry on their distribution work in Wimborne. That was the main item of expenditure.

Under the heading of water there was a more substantial amount, as it included the new pumps at Alderney and the sedimentation tank. With regard to the pumps, these were capable, and did in fact, augment the pressure of the water in Bournemouth, and were really an addition to their statutory obligations. As regards the sedimentation tank, that was again an additional piece of plant which had been provided so as to make perfectly sure that the water they supplied was—as it had always been—pure and wholesome.

New Mains.

Under the heading of new mains, continued the Chairman, there was a substantial item in both undertakings. In fact, in the gas section they had laid nearly 50 miles of additional mains, making a total of 606 miles. In the water section they had laid 9¾ miles of new mains, making a total length of 285 miles. With regard to gas, it was interesting to note that they had taken a supply out to Burley, which was in the New Forest. They went to Burley at the request of people living there, who paid the differential price. The Company were glad to offer them that supply.

They had again followed their policy, which was indicated a little further down in the accounts, of writing off a further sum in respect of the sports ground. Their justification was that it did not bring in any revenue, but did give their workpeople the opportunity of sport and recreation, which they were glad to extend to them.

The number of gas consumers showed a very satisfactory increase, there having been an addition of 1,061 ordinary consumers and 2,605 more prepayment consumers—or a total addition of 3,671. They now had 71,000 gas consumers. With regard to water, they had another 936 consumers, making a total of 34,297. The two departments were not, of course, comparable as they did not cover the same area. In the main their water supply was limited to Bournemouth. As regards the price realized per thousand gallons that showed a small decrease. A good deal naturally depended upon the nature of the season and the quantity of water demanded. The gas receipts were slightly up, due to the fact, as he told them a year ago, that they put the price of gas in the Bournemouth area up by 0·2d., or one-fifth of a penny as from last Lady Day. They were considering whether, in view of the results they had achieved, they should in the near future reduce the differential charges in some of the outlying areas.

The average consumption per consumer still showed a slight drop, and Mr. Cash ventured to think that this was due to the fact that the type of consumer was different and the type of house going up was smaller, coupled with more efficient apparatus. But he thought they had almost reached the end of this decline. The apparatus in use throughout their district was very satisfactory, and the loss due to economy of apparatus must be very nearly, if not entirely, at an end.

Turning to the revenue account and taking gas first, there had been a big jump in coal and oil costs, due to the fact that the tonnage of coal carbonized was up by 13,373 tons. There was also an increase in the cost. As they knew, observed the Chairman, they had been paying the voluntary 1s. per ton on their coal throughout the year. It really did not amount to 1s. per ton for the whole tonnage, as they had received some additional coal of a rather different quality. On the residual side the result was satisfactory, the total increase in money being over £20,000, due partly to the results now being obtained through their benzole manufacture and also under the heading of coke. The demand for coke in the north had been so great that they had not had quite the same competition—and the price had been better.

Increased Gas Sales.

Under the heading of sale of gas there had been a substantial increase in revenue, while the actual output was up by 5½%, which was a very satisfactory increase indeed. With regard to fittings, the staff and organization had been extremely busy during the year, and the total sales of fittings constituted a record—there having been £120,000 worth sold through the showrooms and depôts compared with £100,000 during the previous year. The sales of fittings were double the figure for 1933.

The number of houses piped for gas during the year showed an increase of 2,577, while they had put in nearly 13,000 points, or, say, five points in each house. This again, was satisfactory and meant that people wanted gas in more than one room. As regards the houses which were wired only for electricity, the electrical people could pat themselves on the back as they had recorded a 50% increase; during last year they had wired 32 houses as compared with 21 in 1935. The number of all-electric houses in Bournemouth and the neighbourhood was not very large.

They still continued their policy of making inspections and adjustments of apparatus in consumers' houses, and had carried out a very large number during the year.

So far as public lighting was concerned the picture was not very gratifying. In Bournemouth the main road lighting had gone to electricity, while in Poole the matter was still under consideration. But against that they were continually getting an increased number of lamps in the side roads. A great deal had been said—and had been commented upon elsewhere—on the suggestion that electricity was the right thing for public lighting; and it was stated that there should be uniformity. Uniformity, yes, observed the Chairman, in the sense that the volume of light and its effectiveness should be uniform as far as possible. But that, he ventured to think, was no argument in itself for using electricity, and he repeated that gas could give equally good service. It was important to remember in these matters which were technical that the question of the positioning of the lamps and the intensity of the light were very important matters. Given equal opportunities gas could fulfil all reasonable requirements.

He would like here, in connection with their sales and distribution work, to refer to the efforts made by their staff continuously under the able guidance of Mr. Moon to push the sale of gas in every possible way, and also to acknowledge not only in Bournemouth, but elsewhere, the help they had been getting from the manufacturers, who were undoubtedly producing every year more attractive and more efficient apparatus. He also had to acknowledge the help they received from the Watson House Industrial Centre to which they belonged, where they had every possible means of dealing with every question that might arise and of giving any advice in regard to both domestic and industrial supplies.

Turning now to the water revenue account, the profit here was slightly less. The costs of pumping were up substantially, due in a measure to the new pumps and boosters to which he had already referred. He did not think there was anything special he need say in regard to the water revenue. In both undertakings they had made transfers to the special purposes and renewals fund.

The Company continued to grow, and he would like to refer to Mr. Moon's services. He had onerous responsibilities and his time was very much engaged; the Chairman thought they must begin to think of giving him substantially more assistance in certain directions in order to relieve him of the burdens which rested upon his shoulders.

Rating.

He would also refer to one other matter which had been engaging their attention for a long time—namely, their position in regard to rating. They had at last—in 1937—settled their assessments which applied as from April 1, 1934. The great difficulty was to agree their cumulo valuation. The number of authorities concerned was quite considerable. It was rather a matter of regret that recommendations of the Central Valuation Committee were not more closely followed in an endeavour to get joint action by all the local authorities concerned.

In the profit and loss account he need only refer to one or two particular matters. Adding to the carry-forward the rates adjustment figure of £5,754, which dated back to 1934-35, and was therefore nothing to do with the actual charges for rates in 1936, they had a total of £71,352. That would give them some indication of the result of the valuations which they accepted in the end without having to go to Quarter Sessions. They had reserved a certain amount which they now found was not required. On the left-hand side of the account they would

see that this year £10,000 had been carried to reserve. Income-tax was a substantial charge this year. After allowing for the dividends they would carry forward £65,359, against £65,598 brought in from the previous year.

The Coal Situation.

Continuing, Mr. Cash remarked that he wished to say a few words with regard to the coal question. Coal, he declared, was now virtually a controlled monopoly—that was to say, there were no limitations as there were in connection with gas and water in the sense that their dividends were limited, their carry-forward was limited, and their reserves were limited. The coalowners fixed, through the medium of the Marketing Boards, the price which they charged for coal. As stockholders knew, the Bournemouth Company were well covered by existing contracts for the time being; but they were concerned to know that they would be fairly treated in the future. At present they had practically no means of testing the appropriateness of the increased prices which were being charged throughout the country.

He had been interested to observe in the newspapers the previous day a report of the annual meeting of the Great Western Railway Company, where a very distinguished gentleman, Sir Robert Horne, was presiding. In reference to the coal situation he had said: "In our view a declaration by the Government of its intention to obtain fair play for the coal industry in the competitive markets of the world, even if this involved granting a subsidy, would assist the industry to negotiate a cartel on lines equitable to this country." That statement, said Mr. Cash, had produced leaders and comments in certain newspapers. Sir Robert Horne had also said: "We have to face, too, additional expenditure in respect of coal, and all new contracts for locomotive coal are now being fixed on the basis of an extra 1s. per ton." They believed, went on the Chairman, that certain people, like those in Birmingham, were being asked to pay something like 4s. a ton extra.

There was some reason why one regarded the question of a possible discrimination with concern. In effect, it might arise that under their powers the selling organizations which subsidized export coal might charge the public utility undertakings the larger increase which they seemed to have in mind. The last Board of Trade Return—that for the quarter to Sept. 30, 1936—showed that 12,250,000 tons of coal were shipped for export and foreign bunkers. That compared with the figure in the summary of nearly 49,000,000 tons of disposable coal. They knew that Sir Robert Horne no doubt had South Wales in his mind; but they also knew that a very large quantity of railway coal came from Durham—and it was from there that the Bournemouth Company and others obtained their supplies of coal. They were anxious and willing to pay a proper price for their coal; the miners should be adequately remunerated and the collieries should be able to pay their way; but they were concerned as to the position generally in the direction he had tried to indicate.

Finally, Mr. Cash referred to the balance-sheet, where the position was set out. Their investments were stated, and with regard to the market value as at Dec. 31, 1936, there was a substantial margin in comparison with their purchase price. Their reserve fund investments amounted to £153,000, while special purposes fund and trade and general investments brought the total up to £190,000. The margin to which he had referred was available against any possible drop in investment values. Their pension fund had grown during the year, although they were no longer making the special contribution they were.

The CHAIRMAN then moved the resolution for the adoption of the report and accounts, which was seconded by Sir CHARLES L. MORGAN, C.B.E., M.Inst.C.E. (the Deputy-Chairman), and carried unanimously.

Dividends.

On the proposition of the CHAIRMAN, seconded by Sir JOHN J. WITHERS, C.B.E., M.P., the dividend recommendations of the Directors were approved.

Re-Election of Director and Auditor.

The CHAIRMAN thereafter moved the re-election of Lieut.-Col. H. W. Woodall, C.I.E., M.Inst.C.E., being the Director retiring by rotation. Lieut.-Col. Woodall's connection with Bournemouth, said the Chairman, went back a long way. He used to be their General Manager before the war, and he was a distinguished engineer and a valuable member of the Board.

The resolution was seconded by Sir GEORGE JESSEL, Bart., M.C., and carried unanimously.

The retiring Auditor, Mr. R. H. Glen, F.C.A., was also re-appointed.

Vote of Thanks.

The CHAIRMAN proposed a cordial vote of thanks to the officers, staff, and workpeople of the Company for their services during the past year. They did this every year, he observed, not as a matter of form, but because they really meant it; and he could say quite sincerely that this was no formal resolution. It was fully deserved. The Company was served by a very enthusiastic and hard-working staff from top to bottom, otherwise they would not have the results which they were able to show that day.

Mr. H. G. PALMER (a stockholder) said that he had much pleasure in seconding the resolution. He pointed out that they had to pay an additional 1s. per ton on coal as well as a wages increase, and special attention must be given to details if they were going to make those items up. Therefore, he was sure that Mr. Moon and everyone under him had been paying particular attention to details—and it was service to the consumer which paid.

The ENGINEER AND GENERAL MANAGER (Mr. P. G. G. Moon, M.Inst.C.E., F.C.S.) expressed his sincere thanks for the vote on behalf of the staff and workpeople. He thought that they had all thoroughly deserved it; they had been loyal, efficient, and enthusiastic, but might he also say that the Board and the proprietors had deserved those good services.

The meeting then terminated.

The Hornsey Gas Company

The Annual Ordinary General Meeting of the Proprietors of the Hornsey Gas Company was held at 5, Great Winchester Street, London, E.C., on Friday, Feb. 26, 1937—Mr. A. M. PADDON, M.Inst.C.E. (Chairman of the Company), presiding.

Increased Sales of Gas.

The Annual Ordinary General Meeting of the proprietors of the Hornsey Gas Company was held at 5, Great Winchester Street, London, E.C., on Friday, Feb. 26, 1937, Mr. A. M. PADDON, M.Inst.C.E. (Chairman of the Company), presiding.

The GENERAL MANAGER AND SECRETARY (Mr. K. Leslie Mortimore, A.C.A.) read the notice convening the meeting.

The CHAIRMAN, proposing the adoption of the Directors' Report and the Statement of Accounts for the year ended Dec. 31, 1936 (which were taken as read), first commented on the peculiar circumstances under which the Hornsey Company carried on its business. The Company, he said, had a very limited area of supply. The statutory definition of it was "the Parish of Hornsey;" but the Company did not enjoy even the area so designated, because some years ago it had been compelled to give up to its very powerful neighbour, their all-powerful neighbour, a certain portion of its limited territory. So that it was even more circumscribed than was implied by the Parliamentary definition of the area. That was a disability. In addition, the Company had not the advantage of the developments in the way of housing estates which were nowadays quite general all around the outside suburbs of London. Indeed, it might be said that there was no building, in the ordinary sense of the word, in progress in the Company's area, nor was there likely to be in the future.

In common with other gas undertakings, the Company had to face the normal competition of electricity; and another feature, which might have escaped attention, was that the Company's percentage of prepayment consumers was very small as compared with that of other Metropolitan undertakings. Some of those undertakings had as much as 70 and 75% of their business on the prepayment system, and although that might not be an ultra-remunerative form of business, it was a stabilizing factor because it was more or less continuous in connection with the residential element in the area. The Hornsey Company had barely 25% of prepayment business, so that it was dependent upon the direct appeal to consumers which would lead the latter to adopt and use gas in an added measure to that in which they were already employing it. That really meant a change in policy in the case of the Hornsey Company in a more marked degree than in the Gas Industry generally. The Company had to teach the public, inform the public, and bring to the attention of the public the points of convenience and economy in connection with the use of gas of which hitherto the public had not been aware, which was quite natural, for they had their own businesses to see to and it was for the Gas Company to bring to their attention the further services which gas could render in the future. That could not be done in regard to people who had no margin of expenditure. But Hornsey was a residential district of a rather superior order, and the Company's future business would depend

upon inducing and persuading the consumers to use additional quantities of gas for purposes for which they had not hitherto employed it.

New Showrooms.

That was such an important part of the Company's policy that it was committed, and committed wisely in his opinion, to the building of what he hoped would be one of the most effective showrooms in the Metropolitan area. In dealing with the class of consumer who desired to learn and who could avail himself of the knowledge, the Company would be very ill-advised if it did not make an effort to secure his attention and his business. He believed that when the new showrooms were completed at Hornsey they would afford a perfect model of what the supply of gas should be to consumers of the particular type with which the Company had to deal.

Increased Sales of Appliances.

Turning to the accounts, he said there was not a great deal to which anyone could take exception. In spite of the circumstances he had described, the report recorded an increase of 3½% in the sale of gas as compared with the previous year; under the special conditions that was quite good. Further, it was of interest to note that during the last two years the sale of gas appliances had increased by 74%. That development had been going on in other districts, but the figure was a handsome one as showing response to the Company's enterprise and it was a definite encouragement of the policy which he had outlined in regard to the future.

The statements of capital stock and loan capital indicated the Company's capital powers and how much it could raise in order to meet the requirements of its business. But the Tables had lost their values very largely as the result of recent legislation. At one time it was a very sensitive point of apprehension with the Directors when they saw that their powers for raising capital were running down and when they knew that shortly they would have to pass into the contentious atmosphere of Westminster (where all sorts of untruthful things could be said about them) in order to secure powers to raise more money. Under more recent legislation, however, the Company could secure an Order with very little difficulty, and even with some measure of encouragement from the Government Departments provided it carried on its business properly—and he did not think that even a Government Department could say that the Hornsey Company was not carried on properly. So that nothing remained of the old apprehensions which had attached to the capital statements.

Low Capital per Million.

The Capital Account became more intimate and interesting because it showed that during the year the Company had spent and charged to capital some £10,213; but during the year it had also written off the capital £9,331, so that there was an excess capital expenditure for the year of only £882. But the sales of gas had been increased by 27 million cu.ft. during that period, and in consequence the capital expended per million cu.ft., which was an acid test, had fallen to £486 per million, thus very much improving the Company's commercial prospects for the future, because that figure determined what profit must be made to satisfy the Company's obligations to those who had invested capital in it. At this day a capital expenditure of £486 per million cu.ft. was a very low figure for a Company that had kept its works and all its assets in proper condition, and if any proprietor would care to visit the Company's works he would have no doubt upon that point. He had often heard tributes to the Company's works and to its modern appliances and the efficiency with which those appliances were maintained. So that the low capital figure per million could be accepted without any reservations or qualifications at all, and it was a great help in the coming year to know that that figure had fallen to its present level.

The figures in the Revenue Account followed consistently, though not slavishly, the figures for the previous year. The receipts in respect of the sale of gas and rental of fittings, &c., had increased by £3,957. Residuals had brought in £8,158 more than in the previous year, and those residuals returned to the Company 64% of the money expended on raw materials. That figure was satisfactory, because in the past Companies had often had to struggle for a return of 50%, and 64% showed that the Company was doing fairly well. The unaccounted for gas during the year amounted to only 1½%. That was not the best figure he had ever heard, for he had encountered companies which had sold more gas than they had made, and the Hornsey Company could not hope to aspire to that efficiency! But if the figure were below 5% there could be no quarrel with the administration. The increase of total receipts on the credit side of the Revenue Account was £12,335 as compared with the previous year.

Coal.

On the debit side of the Revenue Account the Chairman pointed out that coal, oil, and so forth had cost £6,840 more than in the previous year, because the Company had made and had sold more gas. But the figure included what he called an *ex gratia* allowance to the coal industry owing to its distressed circumstances in certain portions of the coal areas. He did not suppose that the proprietors of the Hornsey Company would grudge that allowance; but at the same time he had never yet heard, during the 45 years of his experience, that anybody had ever come to the help of the Gas Industry when it had been in distress—and some of the gas companies were in a condition of acute distress after the war—but no one had proposed an *ad misericordiam* allowance in that case. So that the Gas Industry could claim virtue in having conceded that allowance to the collieries.

The expenditure on repairs, maintenance, and renewals amounted to more than 12d. per 1,000 cu.ft., so that the proprietors need not be nervous about the profit declared. On the repair, maintenance, and renewal of meters the Company had spent nearly £1,500 more than in the previous year, and on the repair, maintenance, and renewal of stoves and fittings it had spent about £1,200 more. A new system of business—*i.e.*, hire-purchase—had been more or less forced upon the Industry. It had been received with enthusiasm by the public throughout the world and, indeed, he believed that in America business rested almost entirely on hire-purchase; he had even heard of a man who had bought a ham on the hire-purchase system. The Hornsey Company had to comply with the public demand and had had to adopt the system, while at the same time providing adequate protection for itself in so far as the system had a speculative character. However, so far as the Gas Industry had gone with regard to that business—and it had gone further than it thought it would go, in fact, it had been taken by the scruff of the neck and pushed into it—there was nothing alarming in the risks that had been incurred. But the Hornsey Company protected itself by making reservations in order that during the five years in which it recouped itself it might not be exposed to any unforeseen or important risk. He referred to that item because it was comprised in the figure of £8,144 which was shown in the Revenue Account under the innocent and not very explanatory title of "repair, maintenance, and renewal of stoves and fittings."

The Superannuation and Pensions Fund of the Company received £4,000 in 1936 which was the normal contribution; in addition, as shown by the Profit and Loss Account, there was a further contribution of £3,820. These amounts would have been absolutely staggering to anybody dealing with gas accounts 40 years ago, but they did form an important part of the business in creating the proper and appropriate relations between the employees and the Company, and their money value was reflected in the accounts. The Company was guided actuarily in that matter, and whereas the figure of £4,000 contributed to the Superannuation and Pensions Fund was allowed by the actuary as a normal contribution, the Company had tried to lighten the burden for the future by making the additional payment referred to, which was all to the good.

The final position in regard to the Profit and Loss Account was that £20,868 had been brought in and £21,499 carried forward; so that there had been carried forward £600 odd more than was brought in, which was satisfactory.

If there were any critics of the accounts they would find their opportunity in the Reserve Fund Account, because it was not so large as the Directors would like to see it. There was no opportunity of adding to it because under the sliding scale system the Company was distributing the full dividend to which it was entitled—and the circumstances and statistics of the Company justified it. The Reserve Fund totalled £11,170; but it had the advantage that it was mostly invested outside the Company and was instantly available, therefore, for the one purpose for which it might be required—*i.e.*, the supplementation of the proprietors' dividends if called for. That was very important.

The Special Purposes Fund was a very good book entry; but again nearly £12,000 of that Fund had been invested outside the Company. The Fund could be used only on the certification of a Chartered Accountant to meet exceptional and unforeseen contingencies which were apt to be uncomfortably large. A good many companies invested not only their Reserve Funds but also their Special Purposes Funds in their own revenues, with the consequence that if they wanted any of the money suddenly for the purposes for which it was designed, in order to meet expenses resulting from a fire or anything of that kind, they found it necessary to raise that money or to borrow it from the bank. But the Hornsey Company had invested the money outside so that it was absolutely to hand when it was required, which was rather important.

The Renewal Fund Account was simply a book appropriation, and appropriately so, because the Fund was simply an equalizing Fund for what might be called the normal requirements of maintenance. The maintenance charges incurred were not even for each year. The Fund was simply a floating fund so that the Revenue Account might not be unduly penalized in any period for what was actually a normal and continuous charge. So that very properly the money in the Fund need not be invested.

The investments of the Reserve Fund and the Special Purposes Fund and other investments held by the Company totalled £23,816; their market value on Dec. 31 last was £34,820, which was more than sufficient for one year's dividend and interest. So that the Company's investments were not so poor as they appeared in the balance-sheet.

There was nearly £26,000 in the co-partnership Fund, which was developing in a gratifying manner.

Finally, Mr. Paddon said that the prospects for the ensuing year were no worse and no better than they were twelve months ago, except so far as the Company would be able to effect an improvement by reason of the departures it was making.

Mr. G. W. Carey (Deputy-Chairman) seconded the motion for the adoption of the Report and Accounts.

Capt. H. F. Wilkinson having expressed his thanks for the

Chairman's interesting and very informative remarks, asked how the figure of £486, representing the capital expenditure per million cu.ft. sold, compared with the corresponding figure for the previous year.

The CHAIRMAN replied that in 1935 the figure was £502, which had been reduced in 1936 to £486.

Capt. WILKINSON said that the Company had invested nearly £11,000 of the Reserve Fund and nearly £12,000 of the Special Purposes Fund. He asked if those figures represented the present-day values.

The CHAIRMAN replied that those were the book values and that the market values of the Company's investments were £11,000 more than the book values.

(The report and accounts were unanimously adopted.)

Dividends.

On the motion of the CHAIRMAN, seconded by Mr. CAREY (Deputy-Chairman), the Meeting resolved:

"That there now be declared dividends for the half-year ended Dec. 31, 1936, being the final dividends for the year, as follows:

On the 5% Preference Stock, £5% per annum;
On the 5% Stock, £7 10s.% per annum; and
On the 3½% Stock, £6% per annum.

All less income-tax (making with the interim dividends already paid on the 5% Stock and 3½% Stock respectively £7 10s.% and £6% for the year), and that such final dividends be paid on Monday, March 1, proximo."

Re-Election of Retiring Directors.

The CHAIRMAN, moving the re-election of the retiring Directors, Mr. G. W. Carey (Deputy-Chairman) and Mr. Frank H. Jones, M.Inst.C.E., said that their services were absolutely indispensable to the Company if it were to maintain and improve its position. Mr. Carey had been a Director for very many years during which the Company had had the benefit of his great experience. If he were not present at the Meeting the Chairman would have said a good deal about his qualities, such as his mental acumen, his power to arrive at decisions rapidly, and so on. The Chairman was almost afraid to begin to talk about Mr. Frank Jones because he might not know when to leave off. But Mr. Jones had loomed very large in the gas world recently, where he had had to deal with abnormal difficulties and phenomenal obstacles, and any success which emerged, as it would emerge, would be due largely to his great personal experience and, still more important, the confidence he inspired in all those interests which were essential to the Gas Industry—financial, political, or otherwise. The Company was more than fortunate in having Mr. Jones on the Board. The Chairman acknowledged that no one appreciated that more than he did, because the burden of his duties and responsibilities was reduced to half or less than half by Mr. Jones' wholly effective and very unpretentious support.

Mr. E. L. BURTON, F.S.A.A., seconded and endorsed all that the Chairman had said.

The Resolution was carried unanimously and both Mr. CAREY and Mr. JONES responded.

Re-Election of Auditor.

On the motion of Mr. K. R. MACKAY, seconded by Mr. F. J. BRADFIELD, the Meeting unanimously re-elected Mr. Hyde C. Burton, F.C.A., an Auditor of the Company.

Votes of Thanks.

Mr. FRANK H. JONES proposed a vote of thanks to the officers and staff of the Company for their work during the past year. The best that one could say to a man was "You have done your best;" the officers and staff of the Hornsey Gas Company had indeed done their best; otherwise the Company could not have put forward its extraordinarily good balance-sheet. A good many other companies made a good deal more noise, but there were few which had such solidity. He coupled the vote of thanks with the names of Mr. K. Leslie Mortimore (General Manager and Secretary) and Mr. C. C. V. Gandon (Engineer and District Superintendent).

Mr. E. L. BURTON seconded the vote of thanks and paid a tribute to the Company's officers.

The vote of thanks was accorded with enthusiasm, and both Mr. MORTIMORE and Mr. GANDON briefly responded and assured the Meeting that the thanks expressed would be very much appreciated by all members of the staff.

Mr. F. J. BRADFIELD proposed a hearty vote of thanks to the Chairman and Directors for their able management of the Company's affairs. He expressed appreciation of the Chairman's interesting and informative addresses to the shareholders on the occasions of the Annual General Meetings, and said he was sure the Chairman's colleagues would not object to the statement that the Company's position was due very largely to the Chairman's foresight. The Board of the Company was a body equal to any gas directorate in the country, and he congratulated the members of the Board on the wonderful results they had achieved.

The vote of thanks was seconded by Capt. WILKINSON and was carried with acclamation.

The CHAIRMAN, on behalf of the Board as a whole, expressed appreciation of the vote of thanks. He took the opportunity, however, to emphasize again the value of the work of the Company's officers and staff, and he expressed his agreement with the statement of a colleague in the Gas Industry who had said that, though the Directors of an undertaking did all they could and all that could be expected of them or imagined, their work would be completely ineffective if they had not behind them the loyal support and the skill of their technical officers and staff.

The Meeting then closed.

Trade Notes

C.O.L. Concession for France.

Gas Chambers and Coke Ovens, Ltd., inform us that the exclusive right to construct their C.O.L. Continuous Vertical Retort Plants in France has been acquired by Société Fours et Appareils Stein, of Paris. The latest C.O.L. continuous vertical retort plant in this country, viz., at Abergavenny, was started to work in October last and has been in regular operation throughout the winter.

New Terminals and Bafflers.

The Aerolete Ventilating Company, of 41, Alexandra Road, S.W. 19, have produced an interesting range of bafflers and terminals. The latter are for upright and also for wall fixing; and it is claimed that the strong extractor effect ensures the effective removal of the products of combustion to the outside air. The terminals are manufactured in asbestos-cement and in anodized aluminium, polished or bronzed copper, or asbestos-cement.

Lamps for Public Lighting.

A very useful, comprehensive catalogue of their equipment for public lighting has been published by Messrs. William Sugg & Co., Ltd., of Westminster. The pages indicate the vast improvements which have taken place in the design and performance of gas street lighting units during recent years, and indicate, too, how well the firm are organized to meet all the requirements of modern public lighting. They have, for example, a photometric research laboratory replete with every aid to give accurate readings of performance. The laboratory is at the service of gas engineers in solving their lighting problems.

Achieved in the Service of the Home.

This is the title of an attractive little booklet recently published by the Parkinson Stove Company, Ltd., first copies of which were available at the B.I.F. The booklet has been specially written as a guide to the consumer in providing, in an economical and efficient manner, the three essentials for the comfort of the home—cooking, heating, and water heating.

The manner in which modern Parkinson appliances have been designed and produced to a planned scheme, as the result of scientific application to these problems, is clearly set out, and a guide of this kind should prove very helpful and convincing to the consumer. In addition, this publication, with its attractive illustrations, shows how comprehensive is the service provided by the Parkinson organization. The housewife will find in it a useful work of reference, worthy of a place on the bookshelf. It is more than a mere catalogue of appliances; it is a practical solution to everyday problems—problems to which the Parkinson Stove Company, with its works and laboratories covering more than 15 acres of land near Birmingham, has applied its resources for more than fifty years.

A Big Washer Campaign.

The present month sees the opening of a very large campaign for selling washing machines organized by the makers of "Jiffy" washers. The advertising scheme just commencing is widespread, including the *Daily Mail* front page, large spaces in national, provincial, and Sunday newspapers, and, in addition, attractive advertisements in a long list of women's papers. The scheme is to run throughout 1937, and altogether includes a total of 158,000,000 advertisements. The range of "Jiffy" washers includes models for gas operation, and the manufacturers are anxious to assist gas undertakings as much as they can to benefit by such a comprehensive campaign. They offer a new range of attractive leaflets, cut-outs, &c., for showroom display.

The outstanding feature among the many attractive points which the makers claim for the "Jiffy" washer is its exclusive "vacuum" washing which enables dirt to be *sucked* from clothes instead of being beaten, scoured, or scrubbed. It is claimed that this system ensures the grimiest article being thoroughly washed in three minutes, while "vacuum" washing also protects the most fragile articles from damage. The washer

has been approved by the Institute of Good Housekeeping and is guaranteed for ten years. Full details, with prices and terms, &c., can be obtained from the makers, the Jiffy Automatic Clothes Washer Company, Ltd., Accrington, Lancashire.

Materials Handling Plant.

In the sphere of coal and coke handling for gas-works and coke oven plants, Messrs. Fraser & Chalmers' Engineering Works claim to hold a foremost position. The firm, whose address is Erith, Kent, have forwarded us a copy of their publication dealing with materials handling plant. A considerable portion of this liberally illustrated book deals with plant for gas-works, and among examples given are those at the Southall and Beckton Works of the Gas Light and Coke Company and the Works of the Oldham Corporation and the Southampton Gaslight and Coke Company.

The firm have made a separate and extended study of the problems arising throughout the whole field of coke-handling, with special reference to the Fraser and Chalmers-Robins "Gyrex" screen. Equally, the firm have also made a detailed investigation of the particular needs of gas-works so far as coal-handling is concerned; moreover, they have equipped many gas-works in London and throughout the country with coaling plants ranging in capacity from 20 to 2,000 tons per hour, receiving direct from ships or rail and delivering direct into retort house or storage bunkers.

Bakelite Diaphragm Mountings.

"The observations showed a very definite superiority of the bakelite mountings over the metallic ones, both in regard to their own resistance to corrosion and the preservation of the leather in contact with them.

"The incorporation of phenol-formaldehyde plastics in the construction of gas meters should, therefore, form an important factor in prolonging the life of gas meters. While it is justifiably on purely technical grounds it should also commend itself to the Gas Industry by reason of the employment of a tar product in the preparation of the material." Thus concludes a report by Dr. R. Lessing, Consulting Chemist and Chemical Engineer, on the replacement of tin plate by a plastic in its relation to the functional life of meters.

The tests were carried out at the instance of Metropolitan Gas Meters, Ltd., Hyson Green, Nottingham, and concerned the examination of two meters which for test purposes had been fitted with different mountings, one meter had been fitted in one compartment with the usual discs of tin plate, and in the other compartment with tin-plated discs coated with grey paint. The diaphragm in one compartment of the other meter had been clamped between an outer disc of nickel sheet and an inner one of tin plate, while the leather in the other compartment was fixed between two discs of bakelite. Both meters were rated for a maximum load of 100 cu.ft. per hour and had been in service for about five months during which time 20,000 cu.ft. of gas from the same supply was passed through each meter. After the meters had been dismantled the discs and leather diaphragms were submitted to microscopic examination after the oil dressings had been carefully removed by gentle extraction with petroleum ether. In all cases except the bakelite mountings, the leather and the discs had suffered from their exposure to gas. The discs showed signs of corrosion, and when painted, blistering, while the leathers had all been effected where they were attached to the discs. The bakelite discs, however, both inner and outer, showed no sign of chemical attack or disintegration. Their colour was uniform throughout the surfaces and edges. The leather attached to the bakelite was the only one examined which, apart from the deposition of graphite, had a uniform colour throughout which was the buff colour of fresh leather. The line of contact with the edge of the disc was only discernible by the deposit of graphite, but no difference could be found at the various points in the structure of the leather which showed excellent preservation.

The Gasclock.

One frontage of the fine island stand held jointly by Messrs. Thomas Glover & Co., Ltd., and R. & A. Main, Ltd., at Castle Bromwich was dominated by a Super-Dreadnought among meters. Designed to pass 25,000 cu.ft. per hour, this giant stood about 7 ft. 6 in. high; and a pair of steps were provided for those who wished to view closely, through glass panels fitted for exhibition purposes, the mechanically operated oiling system which has been incorporated. The meter was working slowly on compressed air.

Strikingly contrasted nearby was the latest and most diminutive prepayment device—the "Gasclock" of Messrs. Thomas Glover. Designed to control the use of gas fires through the medium of a time clock and a sixpenny piece, the "Gasclock" has the advantage of fitting unobtrusively into a space of about 6 in. by 3 in. by 3 in.

When in use the "Gasclock" depends entirely upon the supply of gas for its action, an ingenious piece of mechanism starting and stopping the clock when the gas cock is turned on or

The Gasclock (patent applied for) fitted to a Portable Gas Fire.

off. The clock cannot run down. The insertion of a coin opens the gas valve and winds the clock for a run corresponding to the length of time set to be prepaid. Every coin inserted registers a time period on the "unconsumed dial." The charge for the use of the fire can be varied between 1 and 3½ hours for sixpence by suitably adjusting the "set" of the coin slot. By using the "reset lever," provided for closing the gas valve and returning the unconsumed gas dial to zero, an unexpired period may be cancelled.

The illustration here is of the "Gasclock" fitted to a 5-radiant Newscreen portable fire; and the possibilities are stressed of such an outfit for capturing the large field of hotel business still untouched. It is claimed by the manufacturers that such an outfit as we show can be purchased by a hotel or boarding house proprietor for something like two-thirds the cost of a fixed installation. A few units, then, are supplied and stored for each bedroom floor of the hotel; a cold evening or morning does the rest. If the proprietor is not satisfied with the extra business he has already ensured through being right up-to-date, he has merely to adjust the set of the coin slot according to his idea of a suitable profit to himself for providing the service.

Gas Undertakings' Results

Bath.

The report of the Directors of the Bath Gas Company to Dec. 31, 1936, states that a Special Order was made by the Board of Trade on May 6, 1936, confirming the agreement entered into for the purchase of the Melksham Gas Light and Coke Company, Ltd., and granting additional general powers to the Bath Company. The transfer of the Melksham Company was effected on July 1, 1936. The Works have been closed down and gas is now being supplied to Melksham from Bath. A Special Order was also made by the Board of Trade on Dec. 19, 1936, confirming the agreement entered into for the purchase of the Frome Gas Company. The transfer of the Frome Company took place on Jan. 1, 1937, and a main is now being laid to supply gas to Frome from the Bath Works. The Company's sales of gas have increased by 5·6% during the year. A dividend of 2½%, less income tax, was paid in August last for the half-year to June 30, 1936, and the Directors recommend that a dividend of 3%, less income-tax, be declared for the half-year ended Dec. 31, 1936, making a total of 5½%, less income-tax, for the year.

Colchester.

The report of the Directors of the Colchester Gas Company for the year ended Dec. 31, 1936, states that the sales of gas for the year showed an increase of 13 million cu.ft., equal to 4%, which is very satisfactory. Full provision has been made for depreciation of meters, stoves, and gasholders, the sum of £7,053 having been written off capital account, and debited to revenue, under these heads. A sum of £2,600 has been transferred to reserves—viz., £2,000 to the special purposes fund, and £600 to the renewal fund. After making these charges the gross profit on the revenue account amounts to £15,562. Interim dividends were paid in September at the following rates: £5% on the "A" shares, £3 10s.% on the "B" shares, and £3% on the 6% preference stock, and the Directors recommend the payment of final dividends at the same rates, less income-tax.

Eastbourne.

The report of the Directors of the Eastbourne Gas Company for the year ended Dec. 31, 1936, states that the quantity of gas sold during the year was 3,362,215 therms, being an in-

crease of 22,707 therms or 0·68%. The balance at the credit of the profit and loss account available for final dividends, after payment of the interim dividends in respect of the half-year ended June 30, 1936, and providing for interest charges, &c., is £13,338. The Directors recommend the declaration of dividends for the half-year ended Dec. 31, 1936, being final dividends for the year, at the following rates (all less income-tax), viz.: On the "A" stock at the rate of £8 10s.% per annum, on the "B" stock at the rate of £7% per annum, and on the 5% preference stock at the rate of £5% per annum. These dividends, with the interim dividends already paid, make a total distribution for the year of £8% per annum on the "A" stock, £6 10s.% per annum on the "B" stock, and £5% per annum on the 5% preference stock. The amount required for the final dividends is £12,500, leaving a balance of £838 to be carried forward. In January, 1936, £29,000 4% perpetual debenture stock was issued, the premiums received thereon amounting to £1,305. On Dec. 12, 1936, the Board of Trade issued the Eastbourne Gas (Capital Powers) Order, increasing the authorized share capital of the Company by £45,000. In July a branch showroom was opened at 16, Albert Parade, Eastbourne, to meet the needs of consumers in this rapidly developing residential area of the town. An important site in the main thoroughfare of Seaford has been acquired, upon which it is intended to erect showrooms, offices, &c.

East Surrey (Associated Gas and Water).

The sale of gas by the East Surrey Gas Company for the year shows an increase of 3·72%. During the year the Directors have placed £20,000 4% debenture stock at £105%. Dividends at the under-mentioned rates per annum respectively—6% on the cumulative preference stock, 4½% on the redeemable preference stock, 5½% on the preference "A" stock, and 6% on the ordinary "B" stock, all less income-tax—were paid for the half-year to June 30. The Directors recommended that similar dividends be paid in respect of such capital for the second half-year (less income-tax), leaving a balance of £5,577 to be carried forward.

Exeter.

During the year ended Dec. 31, 1936, the Exeter Gaslight and Coke Company have increased their sales of gas by over 16 million cu.ft., and the revenue includes the proceeds of that extra business and, in addition, the receipt from the extra price of 0·2d. per therm as from midsummer last to help meet the increased cost of coal. The number of customers has again substantially advanced from 19,959, in 1935, to 20,570 at the end of 1936. Those customers are purchasing an ever-increasing quantity of apparatus. The sales in 1936 were a record in the history of the Company. There has been an increased revenue from both coke and tar, and a small loss on ammonia products. Coke is still growing in popularity, and with the aid of the gas-ignited coke grate, there is every reason to expect a continuance of the demand. The Company has spent £5,492 in the purchase of property. Business is expanding and the staff necessary to deal with it grows correspondingly. Dividends at the following rates per annum have been declared, less income-tax: 4% on the preference stock, 5% on the preference shares, 7½% on the new ordinary shares, and 10½% on the original stock.

Gloucester (Severn Valley).

The report of the Directors of the Gloucester Gas Light Company for the year ended Dec. 31, 1936, states that the Directors recommend that a dividend at the rate of 5% per annum (less income-tax) be paid on the consolidated ordinary stock of the Company for the half-year ended Dec. 31, 1936 (a dividend at the same rate having been paid for the previous half-year), and that the sum of £597 be carried to the reserve fund in accordance with the Gloucester Gas Order, 1935. During the year the Company issued £80,000 3½% redeemable debenture stock. The sale of gas during the past year shows an increase of 24,276,400 cu.ft. (112,885 therms), being 4·15% over that of the previous year. The ordinary price of gas in Gloucester is 3s. 2d. per 1,000 cu.ft. (equal to 8·17d. per therm), which compares favourably with the prices charged by the largest undertakings in the country.

Hastings (South-Eastern).

The accounts of the Hastings and St. Leonards Gas Company for the year show that, after paying in respect of the June half-year dividends at the rate of £7% per annum on the 5% converted stock; £5 10s.% per annum on the 3½% converted stock; and £6 8s.% per annum on the 5% additional stock, and after making provision for depreciation and contributing £2,000 to the special purposes fund, there is a total available balance of £15,867, out of which the Directors recommend the payment of dividends at the same rates, less income-tax, in respect of the December half-year. This will absorb the sum of £11,282, and leave £4,584 to be carried forward to the credit of the current year. The demand for residuals and for appliances has been very good, and there has been an increase of 491 in the number of consumers. The Company's mains are being extended to Brede and Broad Oak.

Newport (Severn Valley).

The Directors of the Newport (Mon.) Gas Company submit accounts for the year which show that the balance of net revenue is £18,036, to which must be added the amount brought forward from the previous year, of £3,060. From this, the following payments have been made: Interest on debenture stock, £3,519, and interim dividend for half-year ended June 30, 1936, £6,850, making a total of £10,369. It was recommended that a final dividend at the statutory rate of £5% per annum for the half-year ended Dec. 31, 1936, be declared, leaving a balance to carry forward of £3,877. During the year reductions in the price of gas have been made to both ordinary and prepayment consumers.

Rochester (South-Eastern).

The accounts of the Rochester, Chatham, and Gillingham Gas Company for the year show that after paying in respect of the first half-year dividends at the rate of £6 10s.% per annum, less income-tax, on the consolidated ordinary stock, and £5 10s.% per annum, less income-tax, on the irredeemable preference stock, and after paying the second half-year's dividend on irredeemable preference stock there is a total available balance of £29,204, out of which the Directors recommended the payment of the following dividend in respect of the second half-year, viz.: On the consolidated ordinary stock at the rate of £6 10% per annum, less income-tax, which will absorb the sum of £10,758, leaving £18,445 to be carried forward to the credit of the current year. The sale of gas during the past year shows an increase of 4·83% over that of the previous year.

Romford.

The sale of gas by the Romford Gas Company during the year exceeded that of the preceding year by 68·2 million cu.ft., or 9·50%. A total of 2,865 additional consumers have been connected to the Company's mains, and 5,485 appliances fixed on consumers' premises. In accordance with the provisions of the Romford Gas Act, 1929, the sum of £5,005 10s. has been applied out of the profits for the year, for the benefit of the employees. The Directors recommend the payment of the following dividends for the year 1936: On the ordinary stock at the rate of 8% per annum; on the 5½% preference stock at the rate of 5½% per annum; and on the 4% redeemable preference stock at the rate of 4% per annum, less income-tax and less the interim dividends already paid less tax to June 30, 1936, at the following rates per annum: 8% on the ordinary stock; 5½% on the 5½% preference stock; and 4% on the 4% redeemable preference stock. There will remain a sum of £9,963 to be carried forward.

Scarborough (United Kingdom).

The price of gas at Scarborough during the whole year has been less than the basic rate of 9·2d. per therm, and therefore, in accordance with the Company's Act, the Directors recommended that the dividend for the year on the ordinary stocks be increased from 5% to 6%, which accounts for £2,361, that £370 be carried to the reserve fund account, and that the total of these two amounts, £2,732, be placed to the profit-sharing scheme; this amount being one-sixth of £16,393, which was the "consumers' benefit" for the year. The balance standing at credit of net revenue, after taking into account interest charges, interim dividend, &c., is £13,673, and, after providing for final dividend, &c., there remains a balance of £460 to carry forward. The sale of gas during the year amounted to 2,962,341 therms (658,298,100 cu.ft.), an increase of 22,875 therms (5,083,400 cu.ft.), or 0·78%.

South Shields.

The Directors of the South Shields Gas Company in their report for the year 1936 state that the revenue amounts to £126,708 and the expenditure to £105,518, leaving a profit of £21,191, which with Bank, &c., interest, and balance from previous year, makes a total of £35,493. It is proposed to apportion this amount as follows: Year's dividend on consolidated stock at 8½% per annum, less income-tax, £13,599, year's dividend on ordinary stock at 5¾% per annum, less income-tax, £1,535, and year's interest on mortgages, &c., £4,536, leaving a balance to carry forward of £15,824. Gas sales over the year amounted to 514,901,680 cu.ft., which is an increase of 13¾ million cu.ft. in comparison with 1935 and represents about 2¾%. Mr. R. Kenneth Wallis, of Stocksfield, has been appointed to fill a vacancy on the Board. The Directors have entered into a provisional Agreement with the Newcastle-upon-Tyne and Gateshead Gas Company for transferring to that Company the Undertaking of this Company. The Newcastle Company are making the necessary arrangements for an application to the Board of Trade for statutory powers to carry the Agreement into effect. An Extraordinary General Meeting of the Proprietors of the South Shields Gas Company will be held immediately after the termination of the Annual Meeting for the purpose of approving of the Agreement, and authorizing any steps necessary for obtaining the Board of Trade Order.

Sunderland.

The report of the Directors of the Sunderland Gas Company for the year ended Dec. 31, 1936, states that during the year the Sunderland Gas Order came into operation, under which the undertaking of the Seaham Gas and Lighting Company and the Gas Department of the Washington Chemical Company were acquired. The profit and loss account shows that after deducting interim dividend there is an available balance of £24,988, out of which the Directors recommend the payment of a final dividend of £3% (less income-tax), making £6% for the year, on the Sunderland Capital and £1 10s.% (less income-tax) for three months to Dec. 31, 1936, on the capital issued to the Proprietors of the late Seaham Gas and Lighting Company, payable on March 10, leaving £15,509 to be carried forward.

Mid-Southern Utility Company

Substantial Progress

Forty Per Cent. More Electricity Sold

Mr. R. W. Edwards's Address

The annual meeting of the proprietors of the Mid-Southern Utility Company was held at Farnborough on Thursday, Feb. 25, Mr. R. W. EDWARDS presiding.

The SECRETARY (Mr. F. A. Ricketts) read the notice convening the meeting, and after the minutes of the previous annual general meeting, held on Feb. 27, 1936, had been confirmed,

The CHAIRMAN said: The report and accounts have now been in your possession for some days, and with your permission I propose to follow the usual course and take them as read. As mentioned last year, the electricity department continued satisfactorily to extend its sales and, as anticipated, the low tariffs for purposes other than lighting led to an increased use in the various apparatus, offered on attractive terms. The net increase in sales, compared with 1935 (excluding consumptions on our various works and subsidiary undertakings), represented 39·5%. Appliances added during the year increased the load by 19,819 kW, compared with 7,079 the previous year.

The sale of gas for the year showed an increase (excluding consumptions on our works and for public lighting) of 3·4%. It should be pointed out that a large number of cookers have been replaced by modern apparatus, thereby substantially reducing the consumption.

The climatic conditions prevailing in 1936 were, on the average, of a similar order to 1935, the net average night temperature being 42·3°, compared with 42·9°.

The following apparatus were added during the year: Cookers, 2,735; fires, 671; water heaters, 848.

The amount received from residuals was better than in 1935, and represented 59·5% of the cost of coal, compared with 46·6%.

The water department has been satisfactory, and the various plants, reservoirs, and underground works have been well maintained. The reconstruction of No. 1 pumping station was completed during the year and the station is now in commission. The total rainfall recorded by us for the year was 31·26 in., compared with 34·3 in. in 1935.

For the three undertakings the amount of authorized capital is £1,926,368. Of this there has been received £1,740,753. The net expenditure is £1,568,697.

Over the past year, deducting depreciation of £31,943, the capital expended was £118,835.

During the year we added in all departments (including subsidiary undertakings) 10,448 consumers—making a net increase of 47,848 in 13 years.

The Directors recognize the devoted service of their employees and the efficient supervision of the principal officers.

In conclusion I now move: "That the Directors' report and statement of accounts for the 12 months ended Dec. 31, 1936, be and are hereby adopted, and that the dividends as therein recommended be and are hereby declared to be payable to the proprietors on March 1."

This was seconded by the DEPUTY-CHAIRMAN (Mr. Thomas A. Braddock), and passed unanimously, and after Mr. B. R. Green had been re-elected a Director and Mr. H. Read, F.C.A., reappointed an Auditor of the Company, a hearty vote of thanks to the Chairman, Directors, and Staff concluded the business.

ALWAYS IN STOCK

STANTON

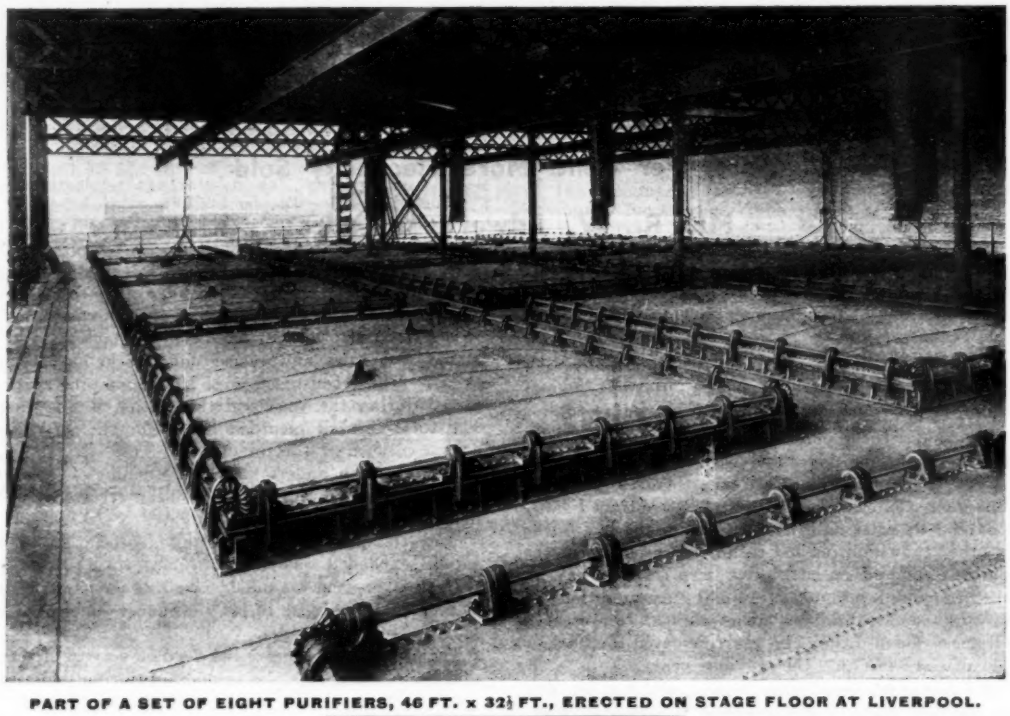
"New" Spun Iron Pipes

12 Feet Lengths	18 Feet Lengths
DIAMETER	DIAMETER
ins.	ins.
3	—
4	4
6	6
7	7
8	8
9	9
10	10
12	12

Vertically Cast Iron Pipes

9 Feet Lengths	12 Feet Lengths
DIAMETER	DIAMETER
Ins.	ins.
3	—
4	4
6	6
8	8
9	9
10	10
12	12
	15
	18
	24

The Stanton Ironworks Company Limited, Near Nottingham



PART OF A SET OF EIGHT PURIFIERS, 46 FT. x 32½ FT., ERECTED ON STAGE FLOOR AT LIVERPOOL.

COMPLETE PURIFIER INSTALLATIONS
WITH BOXES IN C.I. OR STEEL

C. & W. WALKER, LTD., DONNINGTON, Near WELLINGTON—SHROPSHIRE.

'Phone: Lilleshall-Shropshire Nos. 34 & 35 (2 lines) 'Grams: "Fortress," Donnington, Shropshire
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SAWER & PURVES
(BRANCH OF METERS LTD.)
Sole Makers of "THE MODEL COIN COLLECTOR."

Ask for Particulars

It will be a pleasure to supply them

Painted and lettered as required

Excellent Finish

TELEPHONE
Manchester 2289
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Sawer—
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ESTABLISHED 1869.

Derby Road Watford

NELSON METER WORKS, MILES PLATTING, MANCHESTER, 10

Radford Meter Works Radford Road, Nottingham

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

The Stock Exchange closed on Friday in a much more cheerful mood than at the opening of the week. The recovery which started in the Gilt-edged section on Tuesday extended to nearly all sections, and security values on the whole closed materially higher than at the commencement. Home railways were good and more support was forthcoming for ordinary stocks. The leading industrials rose in value, especially Bank, Insurance, and Brewery shares, while the textile section was also firmer. More interest was taken in rubbers, but, with the exception of diamond shares, the mining market remained dull and movements were small.

The improvement in the Gilt-edged section and in other high-class securities was not reflected in the Gas Market, where conditions became even more unsettled than a week ago. The majority of issues again depreciated, and the reactions in some cases were heavy, particularly those of Bournemouth, Brighton, Wandsworth, and Watford ordinaries. It will be seen that stocks and shares in the unofficial list again suffered and the movement also spread to the Provincial Exchanges, where Derby Consolidated experienced a sharp fall. Having regard to the recoveries in similar high-grade investment issues referred to above, it is disappointing to find an absence of any corresponding response in the Gas Market, especially in view of the good reports and accounts for last year which continue to come in. There was a moderate amount of business done during the week, most of it attributable doubtless to forced sales, and the current low prices appear to afford a good opportunity for investment in this market.

Current Sales of Gas Products

The London Market for Tar Products.

March 1.

To-day's prices of tar products in the London Market are as follows:

Pitch, steady at 35s. per ton f.o.b.
Creosote, 5¾d. to 6d.
Refined tar, 3¾d.
Pure toluole, 2s. 4d. to 2s. 5d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 7d. to 1s. 8d.; and 90/160 pyridine, about 8s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

March 1.

The average prices of gas-works products during the week were: Gas-works tar, 19s. 3d. to 24s. 3d. Pitch—East Coast, 34s. to 35s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 34s. to 35s.* Toluole, naked, North, 1s. 11d. to 2s. Coal tar crude naphtha, in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5½d. Heavy naphtha, North, 1s. 1½d. to 1s. 2½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 5⅛d.; low gravity, 4½d. to 4¾d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 8d. to 2s. 9d. Naphthalene, £18 to £20. Salts, 90s. to 95s., bags included. Anthracene "A" quality, 4¼d. to 4¾d. per minimum 40% purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Feb.* 27.

Market continues active and, in most products, a firmer tendency has been noted during the week. Tar acids show a still further increase in value.

Crude gas-works tar.—The actual value is 35s. to 36s. per ton *ex* works in bulk.

Pitch remains unchanged in the meantime at 30s. to 32s. 6d. per ton f.o.b. Glasgow for export, and 30s. per ton *ex* works in bulk for home trade.

Refined tar.—To-day's prices are 3d. to 3¼d. per gallon, free on rails for export, and 3¾d. to 4d. per gallon *ex* works in buyers' packages for home trade.

Creosote oil.—Supplies are well looked after and prices are not lower than the following: Specification oil, 5¼d. to 5½d. per gallon; low gravity, 5½d. to 5¾d. per gallon; neutral oil, 5d. to 5¼d. per gallon; all *ex* works in bulk.

Cresylic acid.—Business is limited for want of supplies and prices show a further increase as under: Pale, 97/99%, 3s. 6d. to 3s. 8d. per gallon; dark, 97/99%, 3s. 3d. to 3s. 5d. per gallon; and pale, 99/100%, 4s. to 4s. 3d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is readily sold at 5¾d. to 6¼d. per gallon *ex* works in bulk, according to quality and district.

Solvent naphtha.—90/160 grade is higher at 1s. 3½d. to 1s. 4½d. per gallon, and also 90/190 heavy naphtha at 11d. to 1s. per gallon.

Motor benzole is quoted at round 1s. 4d. per gallon.

Pyridine.—Prices are nominal at 6s. 6d. to 7s. 6d. per gallon for 90/160 grade, and 7s. 6d. to 8s. 6d. per gallon for 90/140 grade.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	9½	to	0	10	per gallon at works
Motor "	1	3	"	1	3½	" " "
90% "	1	4	"	1	4½	" " "
Pure "	1	8	"	1	8½	" " "

Contracts Advertised To-Day

Compressors, &c.

Walsall Gas Department. [p. 612.]

Cookers and Fires.

Workington Gas Department. [p. 611.]

Governors, &c.

Walsall Gas Department. [p. 612.]

Lighting Goods.

Workington Gas Department. [p. 611.]

Meters.

Birkenhead Gas Department. [p. 611.]
Milford Haven Gas and Water Department. [p. 612.]
Workington Gas Department. [p. 611.]

Paint, Oils, &c.

Birkenhead Gas Department. [p. 611.]

Pipe Laying and Welding.

Walsall Gas Department. [p. 612.]

Pipes, Specials, and Fittings, &c.

Birkenhead Gas Department. [p. 611.]
Milford Haven Gas and Water Department. [p. 612.]
Stockport Gas Department. [p. 612.]
Walsall Gas Department. [p. 612.]
Workington Gas Department. [p. 611.]

Purifiers, &c.

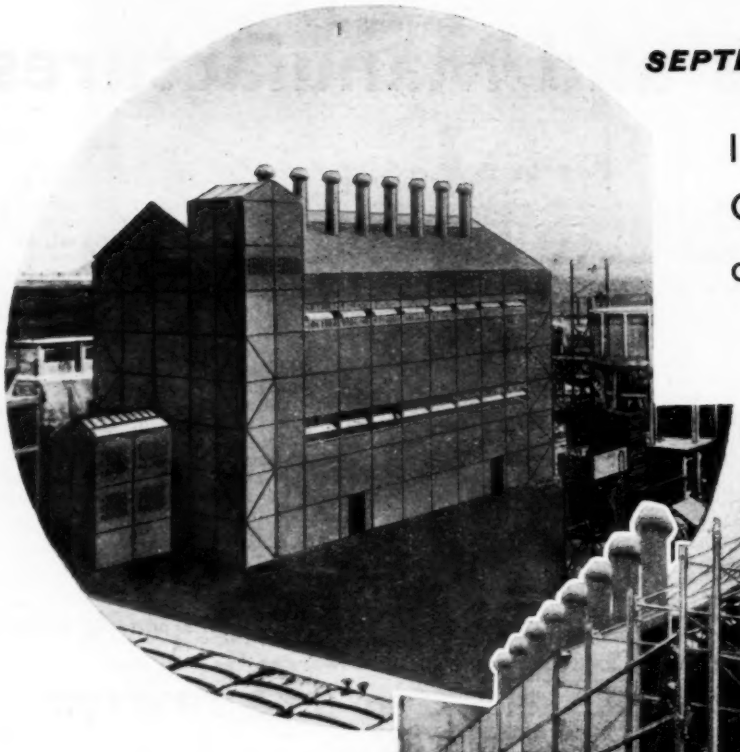
Stourbridge Gas Department. [p. 611.]

Stores (Tools, Bolts and Nuts, Iron and Steel, Brass Fittings, Compo Pipe, Lubricating Oil, Tinware, &c.).

Birkenhead Gas Department. [p. 611.]
Workington Gas Department. [p. 611.]

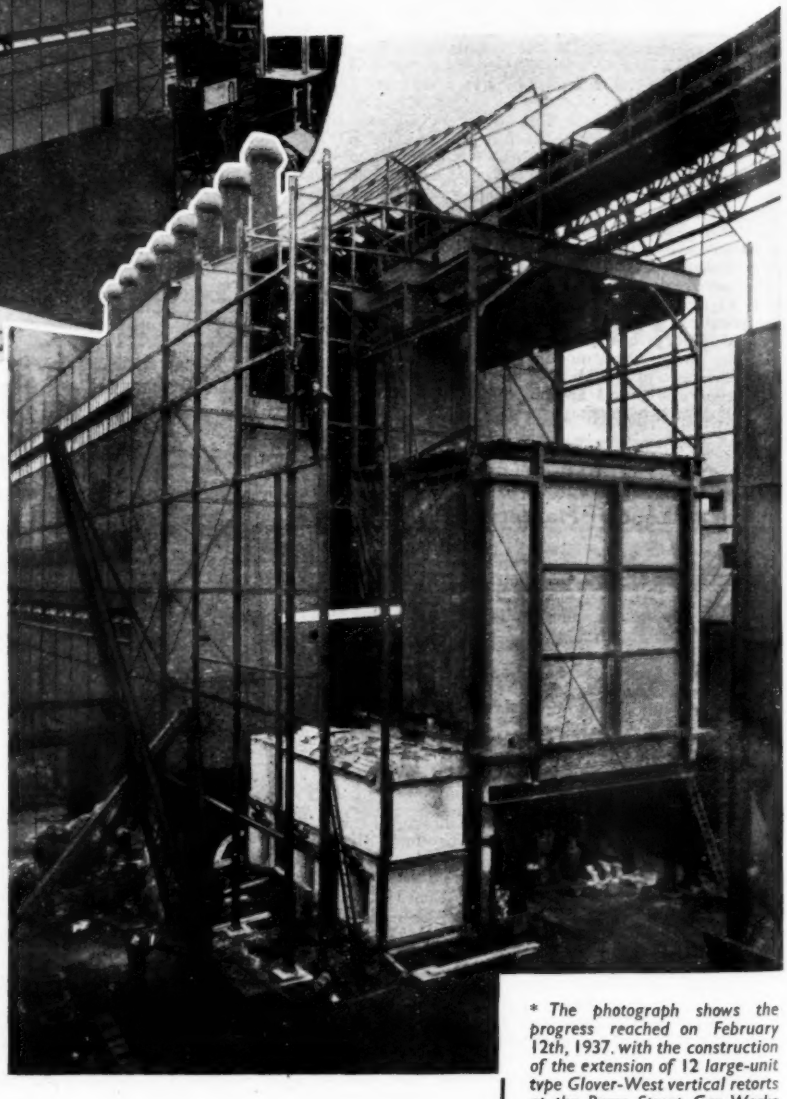
Wash Boilers.

Workington Gas Department. [p. 611.]



SEPTEMBER 1922 . . .

Installation of 64 Glover-West verticals completed at Carlisle



MARCH 1937 . . .

*Extension of 12 large-unit type retorts in course of construction

- GLOVER-WEST VERTICAL RETORTS
- WESTVERTICAL CARBONIZING CHAMBERS
- WEST FUEL-HANDLING EQUIPMENT
- BREEZE-BURNING PRODUCERS
- WASTE-HEAT RECOVERY PLANTS

THE WEST SYSTEMS

. . . coal carbonization with the best advantages of modern practice

** The photograph shows the progress reached on February 12th, 1937, with the construction of the extension of 12 large-unit type Glover-West vertical retorts at the Rome Street Gas Works of the Carlisle Corporation Gas Department. The top picture shows the original plant soon after it began service in 1922.*

WEST'S GAS IMPROVEMENT CO., Ltd.

MANCHESTER:
Albion Ironworks, Miles Platting.

LONDON:
Columbia House, Aldwych, W.C.2.

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 26.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Sept. 7	7⅞	8	Alliance & Dublin Ord. ...	171—176	...	176½
374,000	,,	Dec. 14	4	4	Do. 4 p.c. Deb. ...	96—101	...	...
558,890	,,	Feb. 15	7	7	Barnet Ord. 7 p.c.	165—170*	...	...
300,000	I	Oct. 5	1/9⅜	1/4⅜	Bombay, Ltd.	26/—28/-	...	...
179,305	Stk.	Aug. 10	9⅛	9⅛	Bournemouth sliding scale ...	200—210	—5	203½—205
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	165—170	—5	170—173½
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	135—140	—12	...
50,000	,,	Dec. 14	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
357,900	,,	Feb. 15	7½	7½	Brighton, &c., 6 p.c. Con. ...	155—160*	—8	155—160
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	140—145*	—10	140—148
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	133—138*	—4	...
855,000	,,	Oct. 5	8	7	British Ord.	155—160	—2	152—155
100,000	,,	Dec. 14	7	7	Do. 7 p.c. Pref.	143—148	—2	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	—2	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	103—108	—6	...
200,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	—3	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Jan. 4	4½	4½	Do. 4½ p.c. Deb. ...	80—85	...	80
626,860	,,	Feb. 1	6	6	Cardiff Con. Ord.	122—127	—4	...
237,860	,,	Dec. 14	5	5	Do. 5 p.c. Red. Deb.	108—113	...	...
98,936	I	Oct. 19	2/-	2/-	Colombo Ord.	1⅞—1¾	...	...
24,510	I	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	23/6—25/6	...	...
739,453	I	Oct. 5	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	17/6—19/6	...	...
296,144	I	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	21/—23/-	...	...
1,775,005	Stk.	Feb. 1	5	5	Commercial Ord.	88—93	—2	90—93
620,000	,,	Nov. 30	3	3	Do. 3 p.c. Deb. ...	73—78	—2	73
286,344	,,	Feb. 15	5	5	Do. 5 p.c. Deb. ...	117—122*	...	...
807,560	,,	Feb. 15	7	7	Croydon sliding scale ...	147—152*	—6	...
644,590	,,	,,	5	5	Do. max. div.	111—116*	—1	...
620,385	,,	Dec. 14	5	5	Do. 5 p.c. Deb.... ...	117—122	...	...
239,000	,,	Feb. 1	5	5	East Hull Ord. 5 p.c....	100—105	—6½	...
185,355	,,	Feb. 15	6	6	East Surrey Ord. 5 p.c. ...	122—127*	—3	...
176,211	,,	Dec. 14	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
250,000	I	Nov. 16	6	4	Gas Consolidation Ord. ...	20/6—22/6	...	...
250,000	I	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—21/-	...	19/9
19,255,284	Stk.	Feb. 1	5½	5½	Gas Light & Coke 4 p.c. Ord.	24⅜—25/3a	—⅜	24⅜—25/3
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	80—85	—4	80—85
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref....	97—102	—1	98—100
8,602,497	,,	Nov. 30	3	3	Do. 3 p.c. Con. Deb....	74—79	—1	75—77½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb....	108—112	—2	110—112
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb....	107—111	—2	106—109
700,000	,,	Sept. 7	...	25/5⅝	Do. 3½ p.c. Red. Deb....	97—102	...	...
270,466	,,	Feb. 15	6	6	Harrogate New Cons. ...	122—127*	—4	...
213,200	,,	Feb. 15	6	6	Hornsey Con. 3½ p.c. ...	125—130*	—5	...
5,600,000	,,	Nov. 2	12	8	Imperial Continental Cap. ...	150—155	—3	152—156½
223,130	,,	Feb. 1	3½	3½	Do. 3½ p.c. Red. Deb. ...	91—96	—1	91—93
285,242	,,	Aug. 24	8½	8½	Lea Bridge 5 p.c. Ord. ...	170—180	—7½	...
11,751	,,	,,	10	8	Maidstone Gas 5 p.c. Cap. Stk.	180—190	—5	...
63,480	,,	Dec. 14	3	3	Do. 3 p.c.Prp.Db.Sk.	72—77	—1	...
75,000	,,	Nov. 30	†10	†10	Malta & Mediterranean ...	150—160	...	150
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb. ...	100—105	...	...
231,978	Stk.	Feb. 15	5	5	M.S. Utility 'C' Cons. ...	102—107*	—7	...
968,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	97—102*	—1	...
360,075	,,	Dec. 14	4	4	Do. 4 p.c. Deb. ...	100—105	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	115—120	—2	117—117½
125,000	—	Jan. 4	3½	3½	Do. 3½ p.c. Rd.Rg.Bds.	97—100	...	...
675,000	Stk.	Nov. 16	†6	†6	Montevideo, Ltd.	80—85	...	80—81½
225,000	,,	Feb. 15	7½	7½	North Middlesex 6 p.c. Con.	160—165*	—5	...
396,160	,,	Feb. 1	5	5	Northampton 5 p.c. max. ...	105—110	—3	...
300,000	,,	Nov. 2	†7	†9	Oriental, Ltd....	168—170	...	168—169
416,617	,,	Dec. 14	8	8	Plymouth & Stonehouse 5 p.c.	170—175	...	...
621,667	,,	Feb. 15	8½	8½	Portsmouth & Gosport Cons.	170—175*	—5	177½
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115*	—2	114—115½
73,350	,,	,,	...	5	Do. 5 p.c. Pref. ...	112—117*	—4	...
363,470	I	Sept. 21	1/-	1/-	Severn Val. Gas Cor. Ld. Ord.	20/—22/-	—1/-	21/6
454,510	I	,,	-/10½	-/10½	,, ,, 4½ p.c. Cum. Pref.	21/—23/-	...	...
133,201	Stk.	Feb. 15	5	8½	Shrewsbury 5 p.c. Ord. ...	138—143*	—5	...
90,000	10	June 8	†3½	‡4	South African...	4—5	...	...
1,152,635	I	Sept. 7	1/2⅝	1/2⅝	South East'n Gas. Cn.Ld. Ord.	25/6—27/6	—1/-	26/9—27/4½
845,511	I	,,	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	21/—23/-	...	...
200,000	I	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20/—22/-	...	20/10½
150,000	Stk.	Feb. 15	3½	3½	Do. 3½ p.c. Red. Deb. ...	99—101*	...	...
6,709,895	,,	Feb. 1	5	6	South Met. Ord.	108—113	—3	110—114
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	132—137	—5	133—136½
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	97—102	—1½	...
1,895,445	,,	Dec. 14	3	3	Do. 3 p.c. Deb. ...	73—78	—2	75—76⅝
1,000,000	,,	Jan. 4	5	5	Do. 5 p.c. Red. Deb....	107—112	—3	108—110
1,543,795	,,	Feb. 1	6	6	South Suburban Ord. 5 p.c....	123—128	—4	126—127
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	112—117	—5	113½—118
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	98—103	—2	...
888,587	,,	Dec. 14	5	5	Do. 5 p.c. Deb....	120—125	...	118
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	100—105	...	...
427,859	I	Nov. 16	1/2⅜	9½	S. Western Gas & Water Ord.	20/—22/-	—1/-	20/-
160,523	I	Oct. 19	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pf.	20/6—22/6	...	20/6—22 6
110,000	Stk.	Dec. 14	4	4	Do. 4 p.c. Red. Deb. ...	100—105	...	...
647,740	,,	Feb. 1	5	5½	Southampton Ord. 5 p.c. ...	111—116	...	111
121,275	,,	Jan. 4	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Feb. 15	5½	5½	Swansea 5½ p.c. Red. Pref. ...	110—115*	...	...
106,000	,,	Jan. 4	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—101	...	...
94,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...	...
1,076,490	,,	Feb. 15	6⅜	6⅜	Tottenham and District Ord.	140—145*	—10	140
409,835	,,	,,	5⅜	5⅜	Do. 5½ p.c. Pref....	125—130*	—3	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	110—115*	—5	...
371,850	,,	Nov. 30	4	4	Do. 4 p.c. Deb. ...	100—105	...	...
373,939	,,	Feb. 15	7	7	Uxbridge, &c., 5 p.c. ...	162—167*	...	...
133,010	,,	,,	5	5	Do. 5 p.c. Pref. ...	110—115*	—5	...
1,371,138	,,	Feb. 1	7	7	Wandsworth Consolidated ...	142—147	—13	142½—156½
1,620,615	,,	,,	5	5	Do. 5 p.c. Pref ...	115—120	—2	...
500,000	,,	,,	33/4	4	Do. 4 p.c. Pref. ...	99—102	...	...
1,343,964	,,	Dec. 14	5	5	Do. 5 p.c. Deb. ...	120—125	...	120—123
383,745	,,	,,	4	4	Do. 4 p.c. Deb. ...	101—106	...	...
558,342	,,	Feb. 1	7	7	Watford and St. Albans Ord.	142—147	—13	...
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	110—115	—5	111—115
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	125—130	—4	...
200,000	,,	Dec. 14	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	3½	3½	Do. 3½ p.c. Red.Deb.	99—102	...	...

a.—The quotation is per £1 of Stock. * Ex div. † Paid free of income-tax. ‡ For year. § Actual.

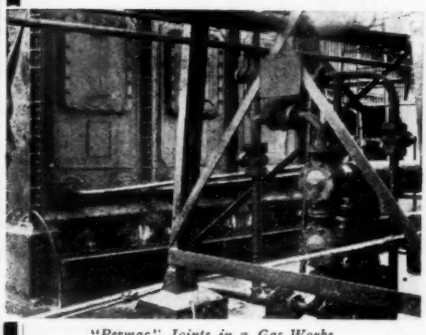
Stock and Share List continued overleaf.

Judge

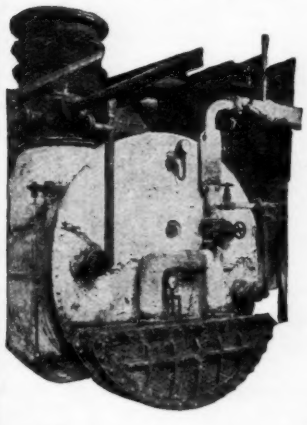
Permac

METAL-TO-METAL JOINTING MATERIAL.

by its Results!



"Permac" Joints in a Gas Works



"Permac" Joints on a Benzol Rectification Still.

Here are further examples of "Permac" Joints. All over the country "Permac," the metal-to-metal jointing material, is preferred by Engineers who have similar severe conditions to deal with. Over 25 years it has stood the test.

"Permac" stands up to all temperatures and pressures, and is equally successful on every kind of joint—steam, gas, oil, by-product.

Permac

METAL-TO-METAL JOINTING MATERIAL.

Beware of cheap imitations.

Sole manufacturers:

THOMAS & BISHOP LTD.

37, Tabernacle St.

LONDON, E.C. 2

Telephone: Clerkenwell 1056, 0584 (2 lines)

STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. Feb. 26.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 1	5	6	Bath Cons.	119—122	−5½	...
1,667,250	,,	Feb. 15	5	5	Bristol, 5 p.c. max.	117—119*	−1	...
120,420	,,	Dec. 14	4	4	Do. 1st 4 p.c. Deb. ...	102—104	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101½—103½	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	122—125	...	...
274,000	,,	Aug. 10	5	5	Newport (Mon.) 5 p.c.max. ...	110—114	...	...
13,200	12	Sept. 7	8½	7	Pontyp'l Gas & W. 10 p.c. 'A'	13½—14½	...	...
13,600	10	,,	6	5	Do. 7 p.c. 'B'	12½—12½	...	...
40,000	10	,,	6	5	Do. 7 p.c. 'C'	12½—12½	...	...
140,778	Stk.	Feb. 1	5	5	Weston-super-Mare Cons. ...	112—113	+1½	...
64,338	,,	Dec. 14	4	4	Do. 4 p.c. Deb.	98—101	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	160—163	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb. 1	5	6½	Chester 5 p.c. Ord.	104½—109½	...	...
92,500	,,	Dec. 14	4½	4	Do. 4 p.c. Pref.	98—102	...	...
36,430	,,	,,	3	3½	Do. 3½ p.c. Deb.... ...	90—95	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	99—103	...	...
2,167,410	,,	Feb. 15	6	6	Liverpool 5 p.c. Ord. ...	133—135*	...	...
245,500	,,	Dec. 14	5	5	Do. 5 p.c. Red. Pref. ...	101—106	...	...
306,083	,,	Jan. 4	4	4	Do. 4 p.c. Deb. ...	103—105	...	...
106,280	,,	Feb. 1	10	10	Preston 'A' 10 p.c.	194—204	...	...
188,219	,,	,,	7	7	Do. 'B' 7 p.c.	134—144	...	...
NEWCASTLE EXCHANGE.								
122,577	Stk.	Feb. 1	8	8	Blyth 5 p.c. Ord.	166—168	...	...
732,000	,,	Aug. 10	5	5	Hartlepool G. & W. Cn. & New	125—127	...	...
2,061,315	,,	Feb. 1	5	5½	Newcastle & Gateshead Con.	24/—25/-*a*	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	102½—103½	...	...
776,706	,,	Jan. 4	3½	3½	Do. 3½ p.c. Deb. ...	99—101	...	...
277,285	,,	Nov. 2	5	5	Do. 5 p.c. Deb. '43...	108—109	...	...
209,820	,,	Aug. 10	8½	8½	South Shields Con.	172—174	...	...
332,351	,	Feb. 1	6	6	Sunderland 6 p.c. max. ...	139—141	+2	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Aug. 10	10	7	Derby Con.	175—185	−10	...
55,000	,,	Dec. 14	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	...	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	...	...	...
20,000	10	Dec. 14	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Aug. 10	10	10	Great Grimsby 'A' Ord. ...	22(—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 15	6	6½	Sheffield Cons.	144—146	−1½	...
95,000	,,	Jan. 4	4	4	Do. 4 p.c. Deb.... ...	101—104	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	Nov. 2	5	25/-*a*	Ascot Ord.	105—110	−13	...
128,182	,,	Jan. 4	5	5	Do. 5 p.c. Pref.	110—115	−5	...
312,083	1	Nov. 16	5	5	Assd. Gas and Water Ord. ...	19/6—21/6	−2/-	19/9
326,071	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	19/6—21/6	−1/6	19/7½—20/6
150,000	Stk.	Sept. 21	...	3½	Do. 3½ p.c. Red. Deb. ...	97—100	−1	...
17,000	,,	Feb. 15	8	8	Bognor Orig. Ord. 'A' ...	160—170*	−12	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	160—170*	−12	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	140—145*	−3	...
37,440	,,	Feb. 1	10	10	Cam. Univ. & Town 10 p.c.max.	200—210	−2	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	142—147	−13	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	102—107	−5	...
65,000	,,	Aug. 10	8½	7½	Eastbourne 'A' 5 p.c. ...	175—180	...	...
198,000	,,	,,	7	6	Do. 'B' 3½ p.c.	140—145	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	113—118	−2	...
130,000	,,	Dec. 14	5	5	Do. 5 p.c. Deb.	118—123	−2	...
24,000	30	Feb. 1	8½	8½	Great Yarmouth 8½ p.c. max.	50—55*	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.	41—45*	...	...
51,160	Stk.	Dec. 14	5½	5½	Do. 5½ p.c. Deb.	123—128	...	...
152,600	,,	Feb. 15	8	9	Guildford Cons.	190—200*	−5	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	112—117*	...	...
68,250	,,	Dec. 14	5	5	Do. 5 p.c. Deb.	117—122	...	...
156,600	,,	Feb. 15	7½	7½	Hampton Court Cons. ...	165—170*	−5	165
107,960	10	Oct. 5	5½	4	Mid Kent Ord.	9½—10½	...	...
230,940	Stk.	Feb. 15	10	10	Oxford & District Ord. ...	213—223*	...	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	108—113*	−7	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	112—117*	...	...
126,193	,,	Nov. 16	7½	7½	Peterborough Ord.	162—172	...	...
64,990	,,	Sept. 7	6½	7½	Redditch Ord.	133—143	...	...
166,850	,,	Feb. 15	8	8	Romford Ord.	157—167*	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100*	...	...
44,000	,,	Sept. 21	5	5	Do. 5 p.c. Deb.	118—123	...	...
10,950	,,	Aug. 24	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 15	5	7	Scarborough Ord.	123—133*	...	...
27,825	,,	Feb. 1	8	8	Shanklin & Ventnor Cons. ...	165—175	−5	...
40,643	,,	Sept. 21	7	7	Slough Ord.	170—180	...	...
221,000	,,	Dec. 14	5	5	Do. 5 p.c. Deb.... ...	115—120	...	...
28,872	1	Nov. 2	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/—22/-	−2/6	...
28,866	1	Sept. 7	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—22/-	−2/6	...
137,730	Stk.	Feb. 15	7	7	Southgate & Dist. 7 p.c. max.	147—152*	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	110—115*	−4	...
117,228	,,	Feb. 15	6	5	Swindon Cons.	108—113*	...	...
60,425	,,	Dec. 14	5	5	Do. 5 p.c. Deb.	115—120	...	...
64,380	,,	Dec. 14	5	5	Torquay and Paignton 5 p.c. Pf.	115—120	...	...
750,000	1	Oct. 5	5·52d.*a*	4	Utd. Kingdom Gas Cpn. Ord.	20/—22 -	−1/-	21/3—21/9
936,338	1	Nov. 16	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	20/—22/-	−1/-	21/1½
674,084	1	Oct. 5	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pref.... ...	20/—22/-	...	...
600,000	Stk.	Sept. 21	3½	3½	Do. 3½ p.c. Red. Deb. ...	99—102	...	98¾
130,000	,,	Feb. 15	5	8	Wakefield Ord.	137—142*	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	103—108*	...	...
82,000	,,	Feb. 1	6	6	Weymouth Ord.	105—110*	...	...
98,384	,,	Feb. 1	6	6	Wolverhampton 6 p.c. Pref....	125—130*	...	...
160,000	,,	Dec. 14	5½	5½	Do. 5½ p.c. Rd. Db	110—115	...	...
370,000	,,	Feb. 15	4	6	York Cons.	108—113*	...	...
90,000	,,	Dec. 14	5	5	Do. 5 p.c. Red. Deb. ...	108—113	...	...
133,640	,,	July 20	6½	6½	Yorktown (Cam.) 5 p.c ons.	133—138	−9½	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	113—118	−5	...
35,000	,,	Dec. 14	5½	5½	Do. 5½ p.c. Deb.... ...	125—130	...	...

* Actual.

STOCK ISSUE.

By Order of the Directors.

ISSUE OF ORDINARY STOCK

PLYMOUTH AND STONEHOUSE GAS LIGHT AND COKE COMPANY.

(Incorporated by Special Act of Parliament, 1855.)

SALE BY TENDER

of ORDINARY STOCK to the amount of

£90,000

(including premiums).

Minimum Price of Issue, £173 per £100 Stock.

THE Directors are prepared to receive TENDERS for the above ORDINARY STOCK on or before 12th March, 1937.

Any amount of Stock, being a multiple of £1, may be tendered for.

A Deposit of 10 per cent. of the nominal amount of Stock tendered for must accompany the Tender, and the balance of the Purchase Money is to be paid to the Company's Bankers, Lloyds Bank Limited, Plymouth, not later than 31st March, 1937.

Dividends are paid half-yearly—viz., on 1st January (for six months to 30th September) and 1st July (for six months to 31st March). Purchasers will receive the first half-year's Dividend—to 30th September, 1937—on 1st January, 1938.

The Stock will be registered and the Certificates issued in the names of the Allottees or their Nominees free of expense.

The Company was incorporated by Special Act of Parliament, and now supplies Gas to consumers in Plymouth, Stonehouse, Plympton, and adjacent districts.

	£	s.	d.
The Net Revenue of the Company for the year ended 31st March, 1936, was	62,468	7	10
The Interest on the issued Loan Capital requires	12,460	0	0
	£50,008	7	10
A full year's Dividend on the Ordinary Stock and Shares at present issued required . .	38,679	7	2
Leaving a surplus (before providing for Bank Interest and Renewal Fund Contribution) of	£11,329	0	8

The Capital now being raised is required for financing the extension of mains, for the replacement of obsolete cookers by modern all-enamel cookers, and for the general purposes of the Company.

For the 12 months to 31st March, 1936, the output of Gas and the sales of Coke and the sales of Gas Apparatus each constituted a record in the history of the Company.

The Dividend paid on Ordinary Stock was 8 per cent. for each of the years ended 31st March, 1929, 1930, 1931, 1932, 1933, 1934, 1935, and 1936.

By a Contract dated 19th February, 1937, Messrs. Seymour, Pierce, & Co., of 6, Lothbury, London, E.C. 2, have undertaken for an Underwriting Commission of 1 per cent. on the Stock and Premiums to procure subscriptions for the whole amount not applied for at the minimum price of £173 per £100 Stock.

A Brokerage of Ten Shillings per cent. on the nominal amount of Stock will be paid on Allotments made in respect of public applications bearing the stamp of a Broker, Banker, or other approved Agent.

Application will be made in due course to the Committee of the Stock Exchange to allow dealings in the Stock now being issued.

Copies of the Prospectus and Forms of Tender may be obtained on application to the undersigned or to Messrs. SEYMOUR, PIERCE, & CO., 6, LOTHBURY, LONDON, E.C. 2.

By order of the Directors,
GEO. H. BOLTON,
Secretary.

26, George Street, Plymouth,
March 1, 1937.

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General Gas
Silent
Fitted with the OUTSTANDING GAS FIRE BURNER OF THE AGE — — —
Unsurpassed for Efficiency and PERFECTLY SILENT
The Switch Control is situated in a convenient position for easy manipulation—the ideal Fire for every Consumer
AUTOMATIC LIGHTING
. . . GAS FIRES
The 'BOUDOIR'

THOMAS GLOVER & CO. LTD.

EDMONTON. LONDON N.18 and BRANCHES